Australian Mammal Society Conference
Toowoomba

Timetable - Day 1

Time	Presenter	Topic
8:30 am		Arrive and mingle
9:00 am		Welcome to Country
9:15 am	AMS President and Chair of Organising Committee	Opening Address
9:30 am	Kelly Dixon	Plenary 1: Challenges and outcomes of conservation projects in remote Northern Territory
10:15 am	Jemma Cripps	Post-flood assessments of threatened small mammals and a bat in northern Victoria following a major flood
10:30 am		Morning tea
11:00 am	Adele Gonsalvez	Insights into platypus venom and beyond
11:15 am	Sophia Jackson	Diagnosing the cause of decline of Lapunginya/eastern quolls through replicated translocations
11:30 am	Lucy Stokes	A new Plio-Pleistocene fossil water-rat (*Hydromys*) from Barrow Island, Western Australia
11:45 am	Cameron Dodd	Cryptic kultarr: integrative taxonomy reveals unrecognised species of carnivorous marsupial in arid Australia
12:00 pm	Tasmin Rymer	Rat chat: vocalisations of adult fawn-footed mosaic-tailed rats (*Melomys cervinipes*)
12:15pm	Beth Brunton	From safe to stranded: land use and climate change threaten habitat of macropods
12:30pm	Julie Broken-Brow	Lunch - Free Titley Workshop!
1:30 pm	Sarah McGrath	Threatened Species Index: the toolbox supporting mammal monitoring and conservation in Australia
1:45 pm	Jo Isaac	Nesting behaviour of a critically endangered marsupial in artificial hollows

2:00 pm	Dana Lockhart	Predator diet analysis as a monitoring tool for conservation of Julia Creek dunnart (*Sminthopsis douglasi*) populations
2:15 pm	Cleopatra Petrohilos	When cells rebel: investigating marsupial cancer susceptibility
2:30 pm	Aviya Naccarella	Generalising generalists: comparative fungal diet of translocated and remnant mycophagous mammals suggests site and species level variation
2:45 pm	Cameron Charley	Drivers of fine-scale antechinus distribution in the diversity hotspot of the south eastern Queensland bioregion
2:50 pm	Erin Thomas	Quoll-ity control: identifying eastern quoll behaviours to increase translocation success
2:55 pm	Kurt Lane	Thermal drone monitoring of koalas in a fragmented coastal urban landscape
3:00 pm		Afternoon tea
3:30 pm	Amy Young	City slickers: platypus on the urban river frontier
3:45 pm	Sally Fuik-Burgemeestre	What makes a mountain home? Structural equation modelling of rat distribution patterns in the Snowy Mountains
4:00 pm	Angie Symon	Foraging ecology of the eastern barred bandicoot across its translocated range
4:15 pm - 5:00 pm		Poster Session
6 pm		Student Dinner: Hello Harry Old Bugger's Dinner: Tatts Hotel

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Timetable - Day 2

Time	Presenter	Topic
8:30 am		Arrive and mingle
9:00 am	Vere Nicholson	Plenary 2: Always consider a veterinary collaborator in your research team
9:45 am	Matthew Phillips	The evolution of bats curtailed the evolution of nightbirds
10:00 am	Nora Campbell	Impact of wildlife culling on the physiological stress and space use of the eastern grey kangaroo
10:15 am	Maddison Randall	Navigating the night: ecomorphological adaptations in the inner ears of bats
10:30 am		Morning tea
11:00 am	Rujiporn Sun	One genomic datum, two applications: advancing population genetics and non-invasive monitoring for a native rat
11:15 am	Shannon Kleeman	Declining body condition across decades is driven by low rainfall and drought in an iconic, semi-fossorial marsupial (*Lasiorhinus latifrons*): implications for species persistence under climate change
11:30 am	Hoang Uyen Thy Nguyen	Waves of hormones, peaks of hope: glucocorticoid insights for captive breeding success in the Leadbeater's possum
11:45 am	Zali Jestrimiski	Do dingoes influence goat population size in a semi-arid pastoral region of Western Australia?
12:00 pm	Phoebe Rynehart	Decoding devil reproduction: non-invasive identification of lactation biomarkers to refine breeding management of Tasmanian devils
12:15pm	Peter Fleming	Integrating the management of total grazing pressure and total predation pressure for mammal conservation
12:30pm		Lunch
1:30 pm	Marissa Parrot	Moth tracker citizen science: using people power to aid the conservation of the mountain pygmy-possum and bogong moth
1:45 pm	Cath Kemper	Ovarian changes during pregnancy and early embryo loss in the Pookila (*Pseudomys novaehollandiae*)

2:00 pm	Tyrone Lavery	A new look at a missing old-world flying-fox from Percy Island (*Pteropus brunneus*)
2:15 pm	Chloe Frick	Sources, samples, and survival - the impact of source population traits on the successful translocation of the brush-tailed bettong (*Bettongia penicillata*) into a predator suppressed landscape
2:30 pm	David Taggart	Body condition, drought and declining reproduction in the semi-arid, southern hairy-nosed wombat (*Lasiorhinus latifrons*)
2:45 pm	Jess Kelly	The utilisation of airborne eDNA to detect cryptic small mammals: a case study targeting the threatened Julia Creek dunnart (*Sminthopsis douglasi*)
2:50 pm	Charlotte Woods	Diet analysis of feral domestic cats (*Felis catus*) in north-west Queensland during a long-haired rat (*Rattus villosissimus*) plague
2:55 pm	Abby Dennien	Do Pookila persist in Queensland?
3:00 pm	Damian Milne	Proposal to develop authoritative distribution maps for all Australian mammals - an update - can I swap?
3:05 pm		Afternoon tea
3:30 pm	Tamara Keeley	Evidence that the short beaked echidna is not a spontaneous ovulator
3:45 pm	Larisa DeSantis	Contextualizing the dietary ecology of *Canis dingo*: a dental microwear comparison across continents
4:00 pm - 5:30 pm		AGM
6 pm		Conference Dinner (by ticket only): George Banks Rooftop Bar

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Timetable - Day 3

Time	Presenter	Topic
8:30 am		Arrive and mingle
9:00 am	Patt Finnerty	Plenary 3: Moving 'beyond-the-fence': reimagining rewilding for mammalian conservation
9:45 am	Kenny Travouillon	Mass death assemblage of Pleistocene megafauna (*Diprotodon optatum*: Marsupialia) at Du Boulay Creek, Western Australia
10:00 am	Millie Scicluna	Two years after major flood, terrestrial floodplain fauna have not recovered
10:15 am	Phoebe Burns	Managing Pookila through fire and drought
10:30 am		Morning tea
11:00 am	Ross Goldingay	This is not rocket science: can artificial tree cavities provide population support to hollow-dependent mammals?
11:15 am	Linda van Bommel	Can livestock guardian dogs manage the impacts of overabundant wild herbivores?
11:30 am	Dan Lunney	Five independent maps help further define the distribution of the iconic bare-nosed wombats *Vombatus ursinus* in NSW
11:45 am	Kevin Rowe	Smoky mouse, *Pseudomys fumeus*, after the 24/25 Grampians-Gariwerd fires
12:00 pm	Nadia Nieuwhof	Understanding Pookila subpopulation baselines in New South Wales and Tasmania
12:15pm	Graeme Coulson	The rise and fall and rise again of brush-tailed rock wallabies in the Grampians Ranges, Victoria
12:30pm		Lunch
1:30 pm	Sarah Woodiss-Field	Quollity monitoring methods
1:45 pm	Amy Edwards	The power of the pitfalls: does increasing sampling effort increase power in pitfall surveys?

2:00 pm	Vera Weisbecker	Cracking the case: cranial shape variation between bettong species (Potoroidae: *Bettongia*) suggests different adaptations to hard biting
2:15 pm	Cassandra Arkinstall	Venturing beyond fences: the rapid population growth of bilbies reintroduced to an exclosure
2:30 pm	Meg Edwards	Are you smarter than a bandicoot?
2:45 pm		Afternoon tea
3:15 pm		Awards and Close

Book of Abstracts

Australian Mammal Society Conference

Toowoomba

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PLENARY 1: CHALLENGES AND OUTCOMES OF CONSERVATION PROJECTS IN REMOTE NORTHERN TERRITORY

Dixon, Kelly

Dr Kelly Dixon is the Ecological Programs Manager at Territory Natural Resource Management and an Adjunct Research Fellow at Charles Darwin University (CDU). She holds a PhD in Ecology from the Australian National University. Kelly leads a dedicated team of ecological staff working in close partnership with First Nations Rangers, Traditional Owners, and other stakeholders to conserve threatened species and critical habitats across the Northern Territory. Through her adjunct role at CDU, she supervises postgraduate students to incorporate research into management-focussed projects. Kelly leads several threatened mammal projects, including the brush-tailed rabbit-rat translocation program which she will talk about in her plenary.

PLENARY 2: ALWAYS CONSIDER A VETERINARY COLLABORATOR IN YOUR RESEARCH TEAM

Nicholson, Vere

Vere studied agriculture and worked on NZ farms before commencing Veterinary studies at Massey University, graduating in 1988. In 1996 after 8 years of veterinary private practice, Vere was engaged at Lone Pine Koala sanctuary where a long-term collaboration with Dr Steve Johnston began.

Vere has worked as a wildlife veterinarian for over 25 years in various wildlife parks in South East Queensland before taking a vet/curator position from 2020 till 2022 at the Hidden Vale Research Station. His current position is at Paradise Country working for Village Roadshow Theme Parks.

PLENARY 3: MOVING ‘BEYOND-THE-FENCE’: REIMAGINING REWILDING FOR MAMMALIAN CONSERVATION

Finnerty, Patt

Dr Patrick Finnerty (he/him) is a postdoctoral research fellow within the School of Life and Environmental Sciences at the University of Sydney. Patt’s current research focus is multifaceted, exploring ways in which species reintroduction or 'rewilding' efforts in Australia can be successfully taken ‘beyond the fence’, investigating complex food web dynamics across multiple ecosystems, as well as exploring sensory conservation approaches targeting large herbivores to inform novel wildlife management approaches, and mitigate human-wildlife conflict.

POST-FLOOD ASSESSMENTS OF THREATENED SMALL MAMMALS AND A BAT IN NORTHERN VICTORIA FOLLOWING A MAJOR FLOOD

Cripps, Jemma K[1]., Lentini, Pia. E[1]., Woodford, Luke P[1]., Bush, Amanda.J[1]. and Lumsden, Lindy. F[1].

[1] Arthur Rylah Institute for Environmental Research, Department of Energy, Environment and Climate Action, Heidelberg, Victoria, 3084, Australia.

Floods are natural disturbances but are increasing in severity and frequency due to climate change. These altered regimes are impacting floodplain species. In October 2022, northern Victoria was subjected to the largest flood event recorded in the last 50 years. Under the Victorian Government's flood recovery program, we undertook surveys to assess the impacts of this flood on threatened mammals.

Surveys for two ground-dwelling mammals, Giles' Planigale (*Planigale gilesi*) and the Fat-tailed Dunnart (*Sminthopsis crassicaudata*) compared three different methods at four sites to assess their suitability for detecting the target species: live Elliott trapping (1980 trapnights), remote cameras (869 trapnights) and thermal imaging using a handheld FLIR (3200m walked on foot). We detected both species 12 months post-flooding, albeit only at one site. A comparison of detection rates showed that cameras (installed with drift fences) were the only effective method for detecting the two target species. Notably, our study recorded the first sighting of *P.gilesi* in Victoria for 11 years.

For the South-eastern Long-eared bat (*Nyctophilus corbeni*), we sought to confirm the presence of an established population at a newly discovered location along the Murray River and to characterise day roosts to determine if these were impacted by flooding. Over eight nights (73 trapnights), we captured 172 microbats, including five *N. corbeni*. We radio-tracked four individuals to their roosts, which were a mix of small-diameter (19.5–36cm DBH), typically multi-stemmed box eucalypt trees. These findings demonstrate that in these floodplain woodlands the species has flexible roosting requirements and roost trees were likely unaffected by flooding.

INSIGHTS INTO PLATYPUS VENOM & BEYOND

Gonsalvez, Adele [1,2], Peel, Emma[1,2], Belov, Katherine[1,2], Hogg, Carolyn J.[1,2]

[1] School of Life and Environmental Sciences, Faculty of Science, The University of Sydney, Sydney, NSW, Australia.
[2] Australian Research Council Centre of Excellence for Innovations in Peptide & Protein Science.

Adele Gonsalvez (she/her) is a PhD student in the Australasian Wildlife Genomics Group at the University of Sydney, focused on using a variety of 'omics resources to investigate the unique genes, peptides and traits of Australia's monotremes.

Amongst the thousands of venomous taxa, there are only 15 venomous mammalian species worldwide, including Australia's own platypus. The platypus venom (crural) system is particularly unique as it is seasonal, sexually dimorphic, and used for intraspecific competition. However, research on platypus venom composition is limited, with previous research restricted by genome quality from over a decade ago. Utilising the new high-quality platypus genome and a suite of publicly available RNA-seq datasets containing nine tissue types and 45 samples, this study capitalises on 15 years of 'omics resources to better identify genes, transcripts and putative proteins of importance to the venom system of this unique species. Using a range of bioinformatic tools, we generated a platypus global transcriptome of over 66,000 transcripts, with approximately 50% expressed in the venom gland. Differential expression analysis identified over 500 genes upregulated (switched on) in the venom gland compared to other tissue types, and we also found over 300 genes specific to the venom gland. Using the DeTox venom discovery pipeline, we identified 13 putative platypus toxins previously unreported for the species, that are both highly upregulated and specific to the venom gland. Novel discoveries within these toxins include members of the serine protease and secretoglobin families, both of which are key components in other mammalian venoms. This study highlights the value of improved genome assemblies for biological discoveries, leveraging a high-quality genome and large RNA-seq library to improve our understanding of platypus venom composition and their venom system more broadly.

DIAGNOSING THE CAUSE OF DECLINE OF LAPUNGINYA/EASTERN QUOLLS THROUGH REPLICATED TRANSLOCATIONS

Jackson[1], Sophia

[1]University of Tasmania, Life Sciences (SB.BA22)-Level 2 main office College Rd, Sandy Bay, Tasmania 7005

Sophia Jackson (she/her) is currently undertaking her PhD in Lutruwita/Tasmania studying eastern quoll translocations. She graduated from the University of Tasmania with Honours in 2024 studying interactions between eastern quolls and their predators and prey to select future translocation sites. She is passionate about research that contributes to management and conservation.

Australia has the highest rate of mammal extinctions in the world, with 10% of mammals going extinct in the last 200 years due to introduction of invasive species, changing fire regimes, and habitat degradation. Conservation translocations are increasingly employed to reverse declines of native mammals but may fail when the cause of species decline is unknown and, therefore, goes unaddressed. However, waiting too long for causes of decline to become clear may also doom species to extinction.

Lapunginya (palawa kani) or eastern quolls (*Dasyurus viverinus)* are a carnivorous marsupial that went extinct on mainland Australia in the 1960s and have been declining in their remaining range in Lutruwita/Tasmania since the early 2000s. My project will conduct replicated translocations under an active adaptive management framework. Survivorship, landscape use, and breeding success of translocated individuals will be monitored through trapping and GPS/VHF telemetry to clarify causes of eastern quoll declines across Tasmania. Results from initial translocations will inform adaptive designs of subsequent ones to refine methods and test different threats to the species.

The outcomes of this project will aid in the conservation efforts of the eastern quoll throughout Australia and develop a framework of adaptive and early intervention to improve the management of threatened mammals.

In my talk, I will discuss selection of translocation sites, the design of replicated translocations for adaptive management, and the preliminary results of the first translocation that occurred in February 2025.

A NEW PLIO-PLEISTOCENE FOSSIL WATER-RAT (*HYDROMYS*) FROM BARROW ISLAND, WESTERN AUSTRALIA

Stokes[1,2], Lucy I., Travouillon[2], Kenny J., Blyth[1], Alison J., Baynes[2], Alexander and Cramb[3], Jonathan

[1]School of Molecular and Life Sciences, Curtin University, Bentley, 6102, Australia
[2]Collections and Research Centre, Western Australian Museum, Welshpool, 6106, Australia
[3]Queensland Museum, South Brisbane, 4101, Australia

One of Australia's most iconic rodents, the Rakali or Water-rat (*Hydromys chrysogaster*), is part of the amphibious Hydromys Division of rodents. The group's centre of diversity is based in New Guinea, where they first evolved before reaching Australia. Genomic research places the arrival of *Hydromys* in Australia in the mid-Pleistocene, about half a million years ago. However, compared to other rodent groups, the Hydromys Division has a poor fossil record, limiting the availability of fossil evidence to provide calibration points for such studies. This research presents a new Plio-Pleistocene fossil species of '*Hydromys*' from Barrow Island, off the northwest coast of Australia. Known from a single specimen, a left first lower molar (Lm_1), this preliminary description represents the first fossil relative described from this widespread group. To attempt to place this fossil within the Hydromys Division phylogeny, the Lm_1 length and width of five Australian and New Guinean species were measured on specimens in the Australian Museum and Western Australian Museum. The morphology of the tooth was also described and compared to that of its closest living relatives. The fossil species is smaller than the modern *H. chrysogaster* and New Guinean *Parahydromys asper*, but larger than other New Guinean Hydromys Division species measured (*H. hussoni*, *Baiyankamys shawmayeri*, and *Crossomys moncktoni*). Future, more precise, dating of the source site to better understand the age of this fossil could redefine our understanding of the arrival of the Hydromys Division in Australia.

CRYPTIC KULTARR: INTEGRATIVE TAXONOMY REVEALS UNRECOGNISED SPECIES OF CARNIVOROUS MARSUPIAL (DASYURIDAE: ANTECHINOMYS) IN ARID AUSTRALIA

Dodd, Cameron[1], Catullo, Renee[1,2], Travouillon, Kenny[2], Baker, Andrew[3,4], Westerman, Mike[5], Umbrello, Linette[2,3]

[1] School of Biological Sciences, University of Western Australia, Perth, WA 6009
[2] Collections and Research, Western Australian Museum, Perth, WA 6106
[3] School of Biology and Environmental Science, Queensland University of Technology, Brisbane, Qld 4001
[4] Biodiversity and Geosciences Program, Queensland Museum, South Brisbane, Qld 4101
[5] Department of Environment and Genetics, La Trobe University, Bundoora, VIC 3086

Cameron Dodd (he/they) is a PhD student at the University of Western Australia researching the taxonomy and evolution of the Sminthopsini – a group of small marsupials including kultarrs, dunnarts and ningauis. I use a combination of modern genetic methods, 3D skull morphology and traditional linear morphology to identify and describe cryptic species of sminthopsin while also investigating how the group has diversified throughout Australia across space and time.

X: @cameronSdodd

Australia has the highest mammal extinction rate on the planet. Despite this, many small mammal species remain understudied, and in some cases are yet to even be discovered. This acts as a major barrier to conservation planning as we cannot protect species that we do not understand or formally recognise as distinct taxa. One group where this issue is particularly pronounced is the marsupial family Dasyuridae, which has had 16 new species described since 2000. This study focussed on the kultarr (*Antechinomys laniger*), a small arid-zone dasyurid whose taxonomy has remained uncertain since the last revision of the group in 1977. Here, we resolve the taxonomy of the kultarr using 12S mitochondrial sequence data, genome-wide single nucleotide polymorphisms (SNPs) and morphometric analyses. We identify three clades of kultarr that are morphologically distinct, largely allopatric and show minimal evidence of genetic admixture. We rediagnose *A. laniger* sensu stricto as an eastern semi-arid-zone species found in central New South Wales and southern Queensland. We resurrect *A. spenceri* as a Kati Thanda-Lake Eyre Basin species restricted to the extensive stony deserts of central Australia. Finally, we describe a new species, found across much of the central and western deserts but fragmented by an avoidance of sand dunes and preference for open stony plains. This research highlights the importance of integrating morphological and genetic data in small mammal taxonomy and emphasises the need for comprehensive geographic sampling within widespread species complexes.

RAT CHAT: VOCALISATIONS OF ADULT FAWN-FOOTED MOSAIC-TAILED RATS (*MELOMYS CERVINIPES*)

Boland, Sanne[1], **Rymer, Tasmin[1,2]**, Brouwer, Lyanne[1,2]

[1] College of Science and Engineering, James Cook University, Cairns, Queensland, 4878, Australia.
[2] Centre for Tropical Environmental and Sustainability Sciences, James Cook University, Cairns, Queensland, 4878, Australia.

Tasmin Rymer (she/her)
@dr_rymer @LyanneBrouwer

Vocal communication plays a key role in animal behaviour, but the vocalisations of many rodent species remain poorly understood. This study describes the vocal repertoire of adult fawn-footed mosaic-tailed rats (*Melomys cervinipes*) across five tests representing five ecological contexts: open field (exploration of a novel environment), novel object (exploration of something new in the environment), handling (simulating a predation event), social interaction (between conspecifics of the same or different sexes), and feeding. Thirty-one captive adults (12 males and 19 females) were exposed to each context in a laboratory setting, with each individual experiencing each context up to three times. Both audible and ultrasonic vocalisations were recorded. Calls were classified based on spectrogram shape, and up to seven call parameters were measured. Thirty-six distinct call types were identified, spanning peak frequencies from 0.4 to 84 kHz, indicating a broad vocal repertoire. We identified several significant associations between call types and ecological contexts, suggesting potentially distinct communicative functions. We also found that there were significant differences in vocal output and call parameters across some contexts. This study provides the first description of the vocal repertoire of fawn-footed mosaic-tailed rats, including the first evidence of ultrasonic vocalisations. It provides new insights into the role of vocal communication in different ecological contexts and contributes to a broader understanding of murid vocal repertoires. Future studies integrating behavioural observations with acoustic analyses will further clarify the social and ecological functions of these vocalisations, enhancing our knowledge of communication in this and other murid species.

FROM SAFE TO STRANDED: LAND USE AND CLIMATE CHANGE THREATEN HABITAT OF MACROPODS

Brunton, Elizabeth, Brunton, Aaron and Conroy, Gabriel

School of Science, Technology & Engineering, University of the Sunshine Coast, Sippy Downs, Queensland 4556

Elizabeth Brunton (she/her/hers)

As the footprint from human populations increases, the associated modification and conversion of natural landscapes in a changing climate places significant pressure on terrestrial wildlife. We investigated habitat dynamics for seven macropod species found in the rapidly urbanising, biodiverse Southeast Queensland (SEQ) region of Australia. Habitat suitability was modelled using presence-only occurrence data in combination with bioclimatic and landscape variables. We evaluated a 'balanced' Random Forest algorithm to fit distribution models, predict potential areas of current distribution, and highlight factors that may influence current and future conservation management. Over one third of predicted current suitable habitat for eastern grey kangaroos, swamp wallabies and red-necked wallabies is within the urban footprint, a greater amount than is in protected areas. Conversely, most current suitable habitats for the other macropod species studied were predicted to occur in protected areas. Worryingly, a decline in suitable habitat (83-96% reduction) is projected for all seven species under future climate scenarios. Our results reveal the vulnerability of macropods in the region which face compounded threats from urbanisation and climate-induced habitat loss. This study's findings highlight a complex set of factors that could hinder macropod species' adaptability to future environmental changes, elevating 'least concern' species to 'of concern'. Combined pressures from climate change, urbanisation, and habitat loss necessitate a broad, adaptive approach to wildlife conservation in human-dominated landscapes.

THREATENED SPECIES INDEX: THE TOOLBOX SUPPORTING MAMMAL MONITORING AND CONSERVATION IN AUSTRALIA

McGrath, Sarah, Lawrie, Tayla, and Heard, Geoffrey

Terrestrial Ecosystem Research Network, The University of Queensland, Australia

Dr Sarah McGrath (she/her) is the Project Officer for the Threatened Species Index (TSX) at the Terrestrial Ecosystem Research Network (TERN). A key focus of her role is working with data providers to incorporate their data into the index to generate up-to-date and reliable trends in abundance at national, state and regional levels. In addition to her TSX role, Sarah continues to pursue her interest in the conservation of primates and other wildlife. In 2023, she completed her PhD at the Australian National University, studying the impacts of illegal selective logging and hunting pressure on the Endangered northern yellow-cheeked crested gibbon (*Nomascus annamensis*) in Veun Sai-Siem Pang National Park, Cambodia. For her Master's research, Sarah investigated the host plant preferences of the Critically Endangered Lord Howe Island stick insect (*Dryococlus australis*) to assist reintroduction to Lord Howe Island.

The Threatened Species Index (TSX) has become an essential data asset for Australia, serving as a key metric for tracking and reporting on changes in the abundance of the country's threatened and near-threatened species at national, state, and regional levels. The TSX continues to expand, incorporating new monitoring datasets annually into a centralised database for various taxonomic groups including mammals. The 2024 update of the Threatened Mammal Index (TMX) includes data on 86 mammalian taxa from a total of 2,243 monitoring time series. At the national scale, threatened and near-threatened mammals have experienced an average decline of 45% in relative abundance since 1985, with populations at managed sites experiencing less severe declines (35%) compared to those at sites with no known management (53%). The TSX – accessible to all groups conducting species-level biodiversity monitoring and research in Australia – is comprised of two key tools: the Data Management Interface and the Trend Visualiser Tool. In this presentation, we will explore the TSX toolbox, demonstrating its functionality and how it can be used to support mammal monitoring and conservation in Australia. Specifically, we will show how the Data Management Interface can be used for data cleaning and storage, and to generate project- and site-level population trends. We will then discuss how the Trend Visualiser Tool can be used to access and interrogate the national TSX aggregated time series dataset, supporting mammal research and collaboration across Australia.

NESTING BEHAVIOUR OF A CRITICALLY ENDANGERED MARSUPIAL IN ARTIFICIAL HOLLOWS

Isaac[1], **Jo** and Begg[1], Alana.

[1] Ecology & Restoration Australia, 10 View Street, Avonsleigh, Vic. Australia

Jo has been studying mammals across the globe for the past 20+ years. Her adventures in arboreal marsupials began with a PhD on Common Brushtail Possums, and her passion for wildlife conservation shows no signs of abating. Jo is currently Principal Ecologist at Ecology & Restoration Australia, where she leads the habitat creation team to design and install high-quality, high-rise habitat for some of our most endangered mammals.

X: @E_R_Australia; Instagram: e_r_aus

Habitat creation in standing live trees is an emerging tool in mammal conservation, particularly in habitats where natural hollows have been lost through land-use change, timber harvesting and/or weather events.

In June 2024, our team installed more than 150 hollows in the Victorian Central Highlands designed for the critically endangered Wollert (Woiwurrung) or Leadbeater's Possum (*Gymnobelideus leadbeateri*). Remote cameras were installed on select hollows from the end of June until mid-October.

Eight hollows were visited by Leadbeater's Possums during this period, and the target species was observed to build nests in three hollows. Possums were seen to investigate hollows across the monitoring period, at the earliest just one day after installation. Cameras recorded nesting behaviour starting on October 6th, 14th and 15th at the three hollows respectively. Nests were created largely in a single night during a flurry of activity, by at least two individuals.

This research highlights the success of our novel hollow creation approach, which utilises a variety of tools and incorporates a focus on known target species ecology, with significance to conservation efforts for a variety of hollow-using species threatened by the loss of hollow-bearing trees.

PREDATOR DIET ANALYSIS AS A MONITORING TOOL FOR CONSERVATION OF JULIA CREEK DUNNART (*SMINTHOPSIS DOUGLASI*) POPULATIONS.

Lockhart[1], **Dana A.**, Gray[1], Emma L. and Baker[1,2], Andrew M.

[1] School of Biology and Environmental Science, Queensland University of Technology, Brisbane, Queensland, Australia
[2] Biodiversity and Geosciences Program, Queensland Museum, South Brisbane, Queensland, Australia

The Julia Creek dunnart (*Sminthopsis douglasi*), found in central and north-west Queensland, is threatened by habitat degradation, climate change and introduced predators. The species' distribution is uncertain, and populations fluctuate markedly over time. Although live trapping has proven successful, there may be more effective monitoring techniques to detect *S. douglasi*. This project will investigate predator diet analysis as a non-invasive tool to monitor and assess *S. douglasi* populations. It will examine the diets of two predators, via native eastern barn owl (*Tyto javanica delicatula*) pellets and feral cat (*Felis catus*) guts. By identifying dunnart remains in predator diets, we will gain insights into the abundance and distribution of *S. douglasi*, relative to other small mammals. Existing data, along with the data gathered here, will allow us to analyse *S. douglasi* populations before, during and after a native long-haired rat (*Rattus villosissimus*) plague (2023-2026). We will compare these results to data obtained from parallel live (Elliott) trapping efforts, to evaluate the accuracy, practicality and cost-effectiveness of predator diet analysis as an alternative monitoring tool. Predator diet analysis may enhance the effectiveness of conservation monitoring programs for *S. douglasi* and will provide new insights into vertebrate predator-prey dynamics in Queensland's semi-arid grasslands.

WHEN CELLS REBEL: INVESTIGATING MARSUPIAL CANCER SUSCEPTIBILITY

Petrohilos[1, 2], Cleopatra, Peel[1,2], Emma, Silver[1,2], Luke W., Hogg[1,2], Carolyn J. and Belov [1,2], Katherine.

[1] School of Life and Environmental Science, University of Sydney, NSW, 2006
[2] Centre of Excellence for Innovations in Peptide and Protein Science

Patra Petrohilos (she/her) is a PhD student in the Australasian Wildlife Genomics Group at the University of Sydney. She uses genomic and transcriptomic data to explore the evolution and genetic interplay of marsupials and their diseases.

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Cancer is ubiquitous in multicellular life, yet susceptibility varies significantly between species. Previous studies have shown a genetic basis for cancer resistance in many species, but few studies have investigated why some species are particularly susceptible to cancer. The Dasyuridae are a family of carnivorous marsupials that are frequently reported as having high rates of cancer prevalence. We hypothesised this high susceptibility may have a genetic basis. To investigate this, we created the first reference genome for the kowari (*Dasyuroides byrnei*), a dasyurid species with one of the highest rates of reported cancer prevalence among mammals. Comparative genomics was conducted alongside nine previously assembled reference genomes: four dasyurid and five non-dasyurid marsupial species, all annotated using the same software to ensure any genomic differences were species-based. Using a gene family evolution analysis, we identified gene families that had undergone significantly rapid expansions or contractions in each lineage. In the dasyurids, we identified large expansions in Ras genes, a well-known family of cancer genes. Interestingly, a similar expansion of Ras genes was also identified in the bandicoot and bilby. These genes were primarily expressed in tissues such as testes, ovaries and yolk sac, so we hypothesise they serve a reproductive role. Future work is required to identify the potential roles of these cancer gene expansions in cancer susceptibility in these marsupial species.

GENERALISING GENERALISTS – COMPARATIVE FUNGAL DIET OF TRANSLOCATED AND REMNANT MYCOPHAGOUS MAMMALS SUGGESTS SITE AND SPECIES LEVEL VARIATION

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Mycophagous mammals and truffle-like fungi form complex interactions. Fungal consumption facilitates spore dispersal, supporting symbiotic relationships between plants and mycorrhizal fungi. These interaction networks however are sensitive to both environmental change and the loss of mammalian species, whether from reductions in geographic range or population size, or through local or global extinction. Disentangling interactions between mammals, fungi, plants, and soil is key to understanding what ecosystem processes have been lost and what role translocated mammals could play in restoring ecosystem function. We use DNA metabarcoding to compare the fungal diet of generalist (eastern barred bandicoot and swamp wallaby) and specialist (long-nosed potoroo) mycophagous mammals within a translocation case study. We found variability in the fungal diet between mammal species, and within eastern barred bandicoots between translocation sites. Our study supports the notion that we cannot generalise mycophagy across species or locations. Thus, the presence of a mycophagous mammal alone may not guarantee their contribution to ecosystem processes. In the context of restoration, we advocate for a localised understanding of these complex interactions and a more tailored site-level restoration approach to meet goals of both conserving threatened species and reinstating lost ecosystem function.

DRIVERS OF FINE-SCALE ANTECHINUS DISTRIBUTION IN THE DIVERSITY HOTSPOT OF THE SOUTH EASTERN QUEENSLAND BIOREGION

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Cameron Charley (he/him). I am a PhD student based at the Queensland University of Technology, where I study drivers of antechinus distribution across the diversity hotspot of south-east Queensland and north-east New South Wales. I have a BSc (Hons) from QUT where I used owl pellets to monitor the Julia Creek dunnart (*Sminthopsis douglasi*) throughout a native rodent plague. I have a keen interest in all things dasyurid.

Considered a national hotspot for antechinus diversity, the South Eastern Queensland bioregion (broadly encompassing south-east Queensland and north-east New South Wales) is home to two threatened species, the endangered *Antechinus arktos* and *A. argentus*, and four other species, *A. flavipes, A. mysticus, A. stuartii* and *A. subtropicus*. All six species need forested areas for foraging and refuge, and at least four species require wet, medium-high altitude forest. While the two endangered species are known only from national parks, the remaining four species occur both in and out of protected areas.

The occurrence and distribution of each species is poorly understood, and their geographical relationships are complex - all six species have distributions known to abut or overlap with congeners, with up to 2-3 species co-occurring in some areas. However, exactly where, how and why each species overlaps are unknown. The conservation status and future projections for each species are also uncertain, especially considering the urbanisation of greater Brisbane and ongoing climate change.

The proposed project aims to gain insight into these various ecological factors, utilising species distribution modelling to predict the preferred habitat and distribution of each species. The generated models will be tested and refined through further targeted on-ground field work, including live and camera trapping, vegetation surveys, or through integration of larger datasets, such as urban or future climate data. The refined models will identify key locations to ensure the appropriate conservation of these species into the future.

QUOLL-ITY CONTROL: IDENTIFYING EASTERN QUOLL BEHAVIOURS TO INCREASE TRANSLOCATION SUCCESS

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Erin Thomas (she/her) is currently a PhD candidate researching eastern quoll translocations at Science) on macropod diel activity and environmental disturbance in western Victoria at the University of Melbourne. Erin has a background in field ecology, working at Museums Victoria on a state-wide bushfire and biodiversity monitoring project.

Conservation translocations are a vital tool in reestablishing and supporting populations of many of Australia's critical weight range mammals, improving genetic diversity, connectivity and population resilience. Yet translocations are costly, time-intensive, and frequently fail. Increasing our understanding of how threats, habitat composition, individual and cohort selection impact translocation outcomes can be used to optimise protocols to improve success. Eastern quoll (*Dasyurus viverrinus)* populations within Tasmania have reduced significantly within the past 20 years, subject to predation, disease, habitat loss and changing climatic conditions. My project is part of a large early intervention for eastern quolls, using several replicated translocations to determine how such factors impact outcomes.

While captive bred populations are a vital resource in conservation, translocating captive individuals into unfenced regions has high risk. Using pre-release behavioural assays may be a viable option to identify unfit behavioural profiles that result in higher dispersal and mortality post-release. I have used a series of simple assays pre-translocation to determine quoll reactivity to novel objects and handling. Post-translocation success is measured by survival and dispersal established by VHF tracking, live-trapping and camera traps.

Further, our pre-release novel object assay was also used to condition quolls to supplementary feeders and cage traps. I will determine if this can be used to increase visitation to supplementary feeders and traps to encourage site fidelity, avoid post-release weight loss and facilitate ongoing health monitoring.

Identifying advantageous characteristics pre-release will facilitate selection of individuals with a higher likelihood of surviving and establishing new populations in future translocations.

THERMAL DRONE MONITORING OF KOALAS IN A FRAGMENTED COASTAL URBAN LANDSCAPE

Lane, Kurt, Bracks, Jessica, Dinsdale, Tegan, Smith-Maloney, Jake, Stone, Adam, Slater, Kade, and Roberts, Ian

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Increasing fragmentation of coastal koala habitat due to urban expansion underscores the critical need to understand how koalas utilise suburban landscapes and how emerging technologies, such as thermal drone surveys, can aid their conservation. This project demonstrates the efficacy of thermal drones for detecting koalas within highly developed areas across the northern Gold Coast suburbs of Parkwood, Arundel, and Helensvale. In July 2024, a survey of 420 hectares across 39 sites identified 43 adult koalas. Notably, 34 of these individuals were located within mapped koala regional ecosystems, while nine were recorded in non-remnant vegetation, typically regrowth, heavily thinned or cleared areas, which is often prioritised for development and typically undervalued in conservation strategies.

Significantly, five koalas were also observed in small, fragmented sites of less than 10 hectares, highlighting their capacity to persist in patchy environments. This adaptability suggests a reduced dependence on specific vegetation types, potentially enhancing their resilience to habitat loss and fragmentation associated with development. Recognising the presence of koalas in non-remnant areas, as demonstrated by these findings, highlights the need for appropriate vegetation classifications to revise ecological evaluations and inform land-use planning.

Drone-based surveys offer an efficient and scalable methodology for monitoring koala populations in complex urban settings, facilitating the identification of vulnerable populations and informing more ecologically sensitive development planning. Establishing long-term monitoring sites will be crucial for tracking population trends and detecting early indicators of decline in rapidly evolving suburban landscapes.

CITY SLICKERS: PLATYPUS ON THE URBAN RIVER FRONTIER

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Amy Young (she/her) is a graduate ecologist from the University of New South Wales with a strong passion for rewilding Australia's natural ecosystems. She recently received First Class Honours for her research on the ecology of platypuses in Brisbane, examining how urban development impacts their movement and habitat. Amy hopes to pursue a career in conservation ecology, with a focus on protecting native species and ecosystem restoration.

As urbanisation accelerates, freshwater ecosystems face growing threats, particularly for species reliant on riparian zones, like the platypus (*Ornithorhynchus anatinus*). This study examines platypus presence, distribution, and habitat use along Moggill Creek in Queensland, across an urban-rural gradient. Using environmental DNA (eDNA) sampling, live trapping, and radio tracking, we assessed the influence of urban development on platypus home range and habitat preferences. Over six nights of trapping, six adult platypuses (four males, two females) were captured, with catch per unit effort (CPUE) similar in downstream urban sites (0.44) and upstream rural sites (0.38). Radio tracking data showed that platypuses in urban zones had home ranges approximately 2.2 times larger than those in rural habitats (95% CI: 1.42 – 3.41, $P<0.01$), aligning with findings from other studies showing increased range sizes in urbanised areas. eDNA sampling confirmed platypus DNA at 13 of 14 sites, with notable absence at the most downstream urban site, suggesting potential habitat limitations. Analysis of macroinvertebrate communities and other freshwater species highlighted significant differences between urban and rural sites, driven by environmental factors like elevation and riparian vegetation, which correlated with higher biodiversity in rural areas. These findings underscore the adaptability of platypuses to urban environments but reveal potential ecological costs, such as expanded home ranges in fragmented habitats. This research, the first to radio-track platypuses in Queensland, emphasizes the need for conservation strategies targeting urban waterways to maintain habitat quality and support platypus populations amidst expanding urbanisation.

WHAT MAKES A MOUNTAIN HOME? STRUCTURAL EQUATION MODELLING OF RAT DISTRIBUTION PATTERNS IN THE SNOWY MOUNTAINS

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Feral ungulates have been consistently linked to reduced ecosystem quality. Across their extended range, they have produced a range of novel communities, where native species are increasingly susceptible to their impacts via competition, predation, disease and habitat loss. The Broad-toothed Rat (BTR) has the potential to be highly impacted by feral horses due to its dependency on the structural elements of riparian corridors – an area which is disproportionally used by feral horses. However, limited research has examined the influence of land tenure on the mediation of feral horse impacts or the distribution of this native threatened species.

This study examines the influence of land tenure on the distribution of BTR across the Snowy Mountains. We surveyed 92 sites spanning four tenures to assess the influence of large herbivores and their impacts on broad-toothed rat habitat values to identify possible drivers of rat distribution. The results indicate that large feral ungulates have both a direct and indirect impact on the distribution and persistence of rats. Further analysis revealed that tenure did not significantly influence the activity or presence of feral horses, suggesting that feral horse impacts are not mediated by tenure types. This study highlights the importance of developing a landscape scale understanding of the direct and indirect drivers of broad-toothed rat distributions as feral horses likely alter the structure of vegetation, reducing the overall quality of habitat and making it less suitable across all tenure types.

FORAGING ECOLOGY OF THE EASTERN BARRED BANDICOOT ACROSS ITS TRANSLOCATED RANGE

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Angie Symon (she/they) completed a Bachelor of Environmental Science (Honours) at Deakin University in 2024, investigating the foraging ecology of eastern barred bandicoots across translocation sites in Victoria. Angie has a passion for invertebrate and mammal ecology, and the intersection of both. Currently, Angie is undertaking an internship at Zoos Victoria with the Threatened Species team, where she continues to work with and research endangered species.

Biodiversity decline continues to accelerate resulting in increased reliance on bolder conservation strategies like conservation translocations. The intentional movement of species within and beyond their historic distribution, often into predator-free fenced reserves or offshore islands, can aid species recovery and conservation. However, translocating species into 'novel' environments they haven't previously occurred in can present risks and impacts on ecosystems. Mainland eastern barred bandicoots (*Perameles gunnii*, unnamed subspecies, hereafter 'bandicoots') have become a flagship species for conservation translocations in Victoria with populations now established both within and outside of their historic range. This work aimed to compare the foraging ecology of bandicoots across these translocation sites. Scat samples were collected from bandicoots and morphologically analysed under stereoscopic microscope. Contents were identified to the lowest possible taxonomic level. Findings suggest apparent differences in the dietary composition of bandicoots across individual translocation sites, and differences when comparing sites within and outside the historic range of the species. Difference in dietary composition across sites suggest flexibility within the foraging capability of the species and highlight the need to assess translocation recipient ecosystems before introducing or reintroducing species and their associated trophic impacts. These results aid understanding of the foraging behaviour of eastern barred bandicoots across their range, highlighting the change in diet between sites, and stressing the altered impact translocated species may pose when introduced into new areas.

NON-INVASIVE MAPPING OF CRITICALLY ENDANGERED NORTHERN HAIRY-NOSED WOMBAT (*LASIORHINUS KREFFTII*) BURROWS USING GROUND-PENETRATING RADAR: A CASE STUDY AT RICHARD UNDERWOOD NATURE REFUGE

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Howe, Andrew (he/him). I am an Ecologist with 18 years of experience working in conservation, including eight years at the Australian Wildlife Conservancy (AWC), where I have worked across northern Australia, the Wet Tropics, and throughout eastern Queensland and New South Wales on a range of species recovery programs. As the project lead for managing the Northern Hairy-nosed Wombat population at Richard Underwood Nature Refuge (RUNR), I am dedicated to protecting one of Australia's most endangered mammals. My passion lies in working towards positive conservation outcomes for threatened species and collaborating across different sectors to develop and implement effective recovery strategies. While much of my work focuses on the diverse ecosystems of northern and eastern Australia, I have a deep love for desert country and always appreciate the rare opportunities I get to work in those landscapes.

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The northern hairy-nosed wombat (NHW), or Yaminon/Warru (*Lasiorhinus krefftii*), is a critically endangered marsupial found at three Queensland sites. Its long-term survival relies on further translocations throughout its historical range. Being fossorial, suitable soil for burrowing is vital, yet little is known about how NHW burrow structures vary across different environmental conditions. This study aimed to evaluate the effectiveness of advanced Ground Penetrating Radar (GPR) technology in enhancing the resolution and detail of NHW burrow architecture and to compare burrow structural characteristics between populations at Epping Forest National Park (EFNP) and Richard Underwood Nature Refuge (RUNR). This study was conducted at RUNR in southern Queensland and was compared with previous EFNP data obtained using earlier GPR and port-holing methods. Advanced Steam DP GPR technology was employed at RUNR, enabling high-resolution, real-time mapping of NHW burrows and providing the most detailed architectural data recorded to date. GPR scans of five burrows at RUNR revealed a mean depth of 2.14 m, shallower than EFNP burrows (2.76 m via GPR; 2.63 m via port-holing). Depth variation likely reflects soil differences, suggesting NHW adapt burrow design to local conditions—supporting translocation potential across variable soil types within their historical range. This study confirms GPR as an effective, non-invasive method for detailed mapping of NHW burrows. Despite a limited sample size, burrows at EFNP were deeper than those at RUNR, highlighting the influence of soil type and informing both future translocation site selection and the design of artificial pre-dug burrows.

SYSTEMATIC ANALYSIS OF SARCOPTIC MANGE DETECTION METHODS IN WILDLIFE

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Chandni Sengupta (She/her) is a former M.Phil. graduate and current PhD candidate at Western Sydney University. She has an interest in exploring disease vulnerability in bare-nosed wombats with particular focus on bare-nosed wombat immune system.

Sarcoptic mange is a highly contagious disease that can cause massive wildlife population declines. We conducted a systematic analysis of data on methods of detecting sarcoptic mange in wildlife. Databases Google Scholar, Scopus, PubMed, Web of Science, Scopus, ProQuest central, CAB direct were searched in addition to grey literature and a manual citation search, then screened in Covidence. Aim of the systematic analysis was – 1. determine the most common methods of detection in wildlife worldwide; 2. evaluate effectiveness and reliability of each method; 3. discuss applicability of methods in different wildlife species and environments. Overall, 232 studies were analysed and classified into four groups – observational, laboratory, occasional and observational/laboratory methods. Observational methods (camera trapping, spotlighting, and survey) are non-invasive and do not require complex machinery while laboratory methods (skin scraping, PCR, ELISA, and histological analysis) are invasive and require proper clinical settings. Occasional methods (mite isolation methods, infra-red thermography, historical data analysis, immunohistochemistry) comprises least used methods which may or may not require animal handling. The fourth category comprises of mange scoring, which was conducted frequently, it can be either observational or laboratory depending on type of mange scoring applied. Skin scrapings were found as the most used technique for confirming mite infestations and guiding treatment. Many studies have used a combination of methods, which has proved to be successful in confirming sarcoptic mange. Feasibility and effectiveness of different detection methods are determined by accessibility, behavior of the target species, and availability of resources for complex diagnostic techniques.

NOBODY KNOWS THE TRUFFLE I'VE SEEN: HIGHLIGHTING UNDERAPPRECIATED MYCOPHAGES

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Georgia Fox (she/her) is an honours student at the University of Southern Queensland investigating the contributions of opportunistic small mammal mycophages in the dispersal of fungi. Georgia is passionate about understanding how small mammals affect the ecosystems around them and vice versa. She is currently a committee member for the Queensland Mycological Society, the Treasurer of the UniSQ Wildlife Society and has volunteered on a variety of citizen science projects. She spends her free time reading, bushwalking and looking for fungi.

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Mammalian mycophages contribute to ecosystem functioning by dispersing fungal spores, particularly for the truffle-like ectomycorrhizal taxa that associate with some dominant tree species. In ecosystems where obligate mycophages are absent, the contributions of opportunistic mycophages may fulfil this ecological role. Previous research suggests that rodents and dasyurids may be underappreciated mycophages. Our project aims to compare the diversity of fungal taxa consumed relative to body size for these sympatric small mammal species. We hypothesise that small mammals such as rodents may contribute more to fungal spore dispersal than previously thought. Three sites of varying elevation, habitat type, and latitude were surveyed in Autumn 2025. Small and medium sized mammals were trapped using Elliott and cage traps, and faeces from trapped animals collected. Faecal spore morphology analysis and eDNA metabarcoding is being conducted to determine the fungal taxa eaten by these mammals. Highlighting the contributions of these lesser known mycophages may have significant implications for quantifying ecosystem health and sustainability, particularly in the Australian context where many obligate mycophages are declining and may be functionally extinct in some areas.

PHARMACOKINETICS OF MOXIDECTIN AND TREATMENT OF SARCOPTIC MANGE IN BARE-NOSED WOMBATS

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Sarcoptic mange, caused by the *Sarcoptes scabiei* mite, is fatal in bare-nosed wombats (*Vombatus ursinus*). Current treatment regimens approved by the Australian Pesticides and Veterinary Medicines Authority include moxidectin (Cydectin®) with two dose rate permits approved and more recently, fluralaner (Bravecto®). We aimed to determine the pharmacokinetic parameters of one of the approved treatment drugs, moxidectin, to aid development of effective treatment protocols. Pharmacokinetic parameters were determined in bare-nosed wombats following a single pour-on dose of moxidectin. Blood samples and fecal samples were collected for 28 days following treatment. Blood chemistry, hematology and concentration of moxidectin in plasma were determined. Blood chemistry and hematology values were found to be similar to those previously published for bare-nosed wombats. Preliminary analysis has shown the mean peak plasma concentration occurred at 7 days, with a mean peak plasma level of 0.5 ng/mL and mean fecal peak concentration at 1 day, with a mean fecal level of 250 ng/g. This study has shown a single pour-on dose of moxidectin has relatively low plasma concentration and contributes to our understanding of treating sarcoptic mange in wombats.

A PARTNERSHIP APPROACH: INVESTIGATING THE INFLUENCE OF LANDHOLDER ATTITUDES ON KOALA CONSERVATION IN SOMERSET, QUEENSLAND

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The effectiveness of conservation programs in agricultural landscapes currently relies on selecting areas with high conservation opportunity that correspond with highly engaged landholders. The characteristics of properties such as size, function, off-property income, and ecological value of native vegetation can be associated with landholder's conservation attitude, and hence level of engagement in conservation. I reviewed landholder survey responses to environmental propositions for their land and used the results to pair property attributes with acceptable (to them) conservation activities. Using these relationships, I designed a conservation framework based on attitudinal factors and property attributes and estimated the potential benefit of habitat restoration to the overall koala population within my investigation area. This framework provides a decision tree through which land managers can tailor proposals to landholders without needing to conduct surveys, increasing the likelihood of uptake and addressing the key issue of engagement. I tested my results at the local level, generating overall koala population estimates through road surveys and applying the framework to individual properties for which I validated koala carrying capacity using several survey techniques (yielding different outcomes). My results suggest that the investigation area has a current koala population of 751 individuals but has a potential carrying capacity (through restoration) of 5,619 koalas. The framework matches potential activities to landholders, provides an alternative to reliance on already-engaged landowners and may be used across a range of species and landscapes.

COMPARATIVE FUNCTIONAL MORPHOLOGY OF VERTEBRAE IN KANGAROOS

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Rika Nakagawa (she/her) is a PhD student at the University of Tokyo, studying comparative anatomy and functional morphology of marsupials. My interest in marsupials began during an undergraduate field study program in Australia, where I participated in wildlife conservation activities.

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Kangaroos perform hopping, a form of locomotion using their hind limbs. Additionally, the functional morphology of the vertebral column in mammals is associated with locomotion and posture. Therefore, this study aimed to reveal the functional morphological characteristics of the vertebrae in kangaroos. Materials included cervical, thoracic, lumbar, and sacral vertebrae from 13 kangaroos and 23 mammals from 4 orders that do not perform hopping. Next, these vertebrae were measured using calipers and a goniometer. The segmental proportions, which represent the percentage of each segment in the spine, were calculated. Additionally, body size was standardized, and profile analysis was performed. The results suggest that the bodies of the thoracic vertebrae are longer and more flexible. Furthermore, the endplate areas of the lumbar and sacral vertebrae were larger, and the segmental proportion of the sacral vertebrae was smaller. Furthermore, it is inferred that there is a high resistance to compression along the body axis. These results suggest that the thoracic vertebrae of kangaroos contribute to the maneuverability of the forelimb during stationary postures. Additionally, the lumbar and sacral vertebrae are presumed to support upright posture and prevent spinal flexion during hopping. This study has highlighted characteristics of spinal morphology in kangaroos that are correlated with hopping and posture.

FROM BASELINE TO BLUEPRINT: EDNA DATA INFORMING PLATYPUS CONSERVATION IN SOUTH-EAST QUEENSLAND (2016–2024)

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In 2016, Wildlife Queensland identified a decline in reported platypus (*Ornithorhynchus anatinus*) sightings across Queensland which prompted the development of a long-term environmental DNA (eDNA) monitoring program in South-East Queensland. Initially focused on 62 sites, the program expanded to over 300 sites by 2023, sampling a range of rural, peri-urban and urban catchments in collaboration with local councils and community groups.

Since then, the data has revealed areas of population persistence as well as localised declines, especially in catchments subjected to urban stream syndrome. Building on the initial three years of data that identified possible population declines, further analysis was conducted on five years of data to identify key habitat variables and the association with platypus presence. Topographic wetness index, coarse organic matter and complex benthic substrate were the strongest predictors of platypus presence. These findings highlight the importance of water availability and in-stream food resources for supporting platypus populations.

This project has contributed to local government planning and conservation strategies by providing evidence-based recommendations. The eDNA approach has proven invaluable for tracking cryptic species over large spatial and temporal scales. Future directions include integrating further habitat assessments, hydrological and climate data with multi-species eDNA to improve freshwater biodiversity conservation under increasing urbanisation and climate pressure.

POUCH PERFECT: MAPPING RUFOUS BETTONG GROWTH AND DEVELOPMENT TO SUPPORT FIELD MONITORING

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[3] Lockyer Valley Regional Council
[4] The University of Queensland, Hidden Vale Research Station, Grandchester

Lisa Swales (she/her) works as an Environment Project Officer for local government focusing on projects that include natural areas management, koala threat mitigation and environmental policy. Driven by her passion for conservation, she has gained diverse experience working in various roles from monitoring wild koala populations to working in captive wildlife management.

The rufous bettong (*Aepyprymnus rufescens*) is one of the most commonly occurring species of bettong in Australia, yet there is a notable paucity of research on their reproduction. While pouch young development has been described for other more threatened bettong species, the equivalent data for rufous bettong is lacking. This research aimed to document the growth and development of rufous bettong pouch young in captivity to provide a practical field resource for age estimation.

Female rufous bettongs from a small captive breeding colony were pouch-checked during routine weighing, and more frequently following pairing or weaning of young. Following confirmation of pouch young, females were briefly anaesthetized at regular intervals to allow for measurements and photographs of the pouch young without causing undue stress to both animals. Close monitoring of pouch young with known birth dates, facilitated accurate staging of developmental milestones for this species. The rufous bettong follows the consistent developmental sequence known of other bettong species. We provide photographic reference for key developmental milestones including limb development, vibrissae eruption, pigmentation changes, fur growth stages, eye and ear progression and signs of pouch exit. This study is the first to establish precise timing for these stages for rufous bettong.

Establishing the age at which these developmental stages occur allows researchers and wildlife managers to accurately assess the age and condition of pouch young encountered during fieldwork or free-range captive management This has important applications for population monitoring, translocation planning, and evaluating reproductive success in conservation programs.

THE EVOLUTION OF BATS CURTAILED THE EVOLUTION OF NIGHTBIRDS

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Matt Phillips is an evolutionary biologist at QUT. His lab group uses molecular, morphological, and palaeontological data to trace the evolution of mammals (usually marsupials and monotremes) and sometimes birds.

Nocturnal members of Strisores, including nightjars, owlet-nightjars, oilbirds, potoos and frogmouths are arguably the birds that are closest in ecospace occupation to bats (Chiroptera). We set out to test the prediction that if the diversification of bats either ecologically displaced or diminished evolutionary opportunities for nocturnal birds, then Strisores, which originated before bats, should suffer a decline in their rate of diversification, coincident with the global spread of bats. The Strisores early fossil record is sparse, so we employed molecular dating based on a nuclear and mitochondrial DNA dataset, to trace their diversification. After first ameliorating molecular substitution rate biases associated with life history rate correlates, we traced the origin of Strisores to just after the Cretaceous-Paleogene mass extinction event, ~64 million years ago, after which they rapidly diversified. The molecular phylogenetic signal for Strisores diversification disappears in coincidence with the sudden appearance of bats close to the Paleocene-Eocene Thermal Maximum (~55 million years ago) in the fossil records of all continents, except Antarctica. The hiatus in diversification among the ancestors of modern members of Strisores lasted until the *Grande Coupure* global cooling and extinction event, ~34 million years ago. Thus, diversification patterns are consistent with evolutionary competition between bats and Strisores, with a possible mechanistic link to temperature variation.

IMPACT OF WILDLIFE CULLING ON THE PHYSIOLOGICAL STRESS AND SPACE USE OF THE EASTERN GREY KANGAROO

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In the ACT, eastern grey kangaroos are culled yearly based on a rigorous assessment of the surrounding environment. This management strategy aims to maintain herbivore populations at sustainable levels, benefiting both the ecosystem and the kangaroos themselves. In earlier research, I observed that kangaroos at culled sites exhibited increased vigilance post-cull. However, no significant changes were detected in other key behaviours, suggesting a limited behavioural response overall. However, vigilance alone is not a direct measure of stress, and the physiological impact of the cull remained unclear. To address this, we used faecal hormone analysis combined with spatial mapping of faeces to evaluate stress responses in kangaroos following the annual cull. Our findings show a decrease in faecal glucocorticoid metabolite levels at cull sites immediately after the cull. Additionally, faeces were found further from the tree line post-cull, indicating increased use of open areas, a potential sign of reduced wariness. Both results are likely mediated by the increased vigilance observed previously. Together, this research highlights the effectiveness of combining behavioural observations with physiological benchmarks to evaluate the welfare of large mammal populations.

NAVIGATING THE NIGHT: ECOMORPHOLOGICAL ADAPTATIONS IN THE INNER EARS OF BATS

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Maddison Randall (she/her) is a PhD candidate in the Weisbecker Lab at Flinders University researching the inner ear shape of bats and how it relates to their diverse echolocation abilities. Maddison's interests include the evolution of sensory organs, bioacoustics, and vertebrate ecology.

Echolocating bats possess a sophisticated audio-vocal system for emitting and perceiving ultrasonic sound (20kHz - 212 kHz). This biosonar system enables bats to navigate and forage, often in complete darkness. This unusual ability has evolved through structural modifications of the inner ear – such as an enlarged cochlea, an increased number of spiral turns and a longer basilar membrane relative to non-echolocating bats and other mammals. Given that these structural modifications underpin high-frequency hearing and, thus, echolocation in bats, exploring these adaptations may provide insights into the evolutionary origins of echolocation in Chiroptera. Moreover, the variation of inner ear morphologies may uncover how this unique sensory system has enabled bats to diversify and occupy a broad range of ecological roles and dietary niches. For my PhD, I will explore how echolocation, habitat preference and foraging behaviour influence cochlea shape variation in bats. I will obtain linear measurements of the inner ears from µCT scans. I will also generate endocasts of the cochlea to perform 3D geometric morphometric analyses. This knowledge could contribute to understanding community structure and habitat boundaries, and applied to the fossil record may provide insights into habitat preference and echolocation capabilities in extinct bats.

ONE GENOMIC DATUM, TWO APPLICATIONS: ADVANCING POPULATION GENETICS AND NON-INVASIVE MONITORING FOR A NATIVE RAT

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Dr. Rujiporn (Thavornkanlapachai) Sun (She/Her) is a geneticist at the Department of Biodiversity, Conservation and Attractions in Western Australia, specialising in population genetic assessment of threatened mammal species. Her research spans PhD, postdoctoral, and current projects, all heavily focused on genetics in translocations—including identifying source populations, evaluating hybridization outcomes, and assessing genetic diversity and inbreeding levels. Her recent work has centred on advancing scat genotyping technologies. She has successfully designed/co-designed molecular ID tags using Single Nucleotide Polymorphism arrays for multiple bat and mammal species, developed species-specific sexing markers and co-created an R package for analysing genetic data from scats.

The Greater Stick Nest Rat (GSNR, *Leporillus conditor*), native to Australia, is now restricted to two remnant populations on offshore islands. Since 1985, translocations have been undertaken to bolster their numbers. To inform future translocations, we analyzed genetic diversity and structure using the double digest restriction-site associated DNA (ddRAD) data from tissue samples (2019–2024) of six translocated and two remnant populations. Most populations exhibited similar genetic diversity, but two translocated populations had lower diversity, higher inbreeding, and were genetically differentiated from the others. We identified five populations, including the remnant ones, as potential translocation sources. To support ongoing species monitoring, we developed a non-invasive scat DNA analysis toolkit based on the ddRAD dataset. Using this data, we designed a panel of fifty informative SNP loci for the MassARRAY platform. Additionally, a separate sexing assay incorporating Y chromosome and autosomal markers was created to determine the sex of individuals from scats. To assess the effectiveness of these tools, we genotyped 107 scats from one population, identifying 23 individuals and sex-specific movements. Scat distribution indicated distinct occupied areas, with males traveling further distances (230m–250m) than females.

These findings demonstrate the versatility of genomic data for ecological research, aiding population genetic assessment, individual identification, and sex determination. The genetic diversity data highlights critical translocation source populations, while the scat DNA fingerprinting method offers a non-invasive alternative to live-trapping, improving monitoring efficiency and reducing stress on GSNR populations. Together, these advancements provide valuable tools for the species' long-term conservation.

BODY CONDITION, DROUGHT AND DECLINING REPRODUCTION IN THE SEMI-ARID, SOUTHERN HAIRY-NOSED WOMBAT (*LASIORHINUS LATIFRONS)*

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David is an adjunct Associate Professor at the University of Adelaide and Principal Scientist of Fauna Research Alliance. He has broad expertise on marsupial ecology, reproduction, reintroduction biology, and conservation, with specific expertise on wombats, rock-wallabies, koalas and marsupial carnivores. David is passionate about the conservation of Australia's unique wildlife and in bringing together diverse expertise and innovative techniques to halt species decline and improve ecosystem health and resilience at the landscape scale.

Southern hairy-nosed wombats are a long-lived, slow reproducing marsupial from semi-arid southern Australia. Breeding in this species is thought to be negatively affected by dry times and drought. With climate-change projected to increase drought duration and severity across its distribution, there is an urgent need to better understand the relationship between rainfall and breeding in this species. Using a 32-year dataset (>1,000 adult females and >500 pouch young), we found the probability of an adult female having a pouch young in the breeding season to be significantly affected by winter-spring rainfall and drought severity, but most strongly by female body condition. All births occurred between July-January, with a notable peak between August-October (87.7 %). Drought in late autumn to early winter significantly delayed births by ~ 29 days. The probability of females having a pouch young in the breeding season declined significantly across 25 years (34 % decline) associated with a long-term decline in body condition. Both date of cessation and duration of the breeding season have significantly declined over the study period. Increasing drought prevalence and significant declines in rainfall and vegetation greenness over the last few decades suggest that the breeding season is shortening as a response to the drying climate. As the probability of females breeding is strongly linked to body condition, which is in turn negatively affected by drought, the ongoing effects of climate change pose a significant threat to both our study population, and the persistence of the southern hairy-nosed wombat more broadly.

WAVES OF HORMONES, PEAKS OF HOPE: GLUCOCORTICOID INSIGHTS FOR CAPTIVE BREEDING SUCCESS IN THE LEADBEATER'S POSSUM

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Hoang Uyen Thy Nguyen (she/her) is doing her Master study in the Wildlife Conservation and Reproductive Endocrinology Laboratory at La Trobe University. Her project focusses on the role of glucocorticoids in reproduction, diet and management of the critically endangered Leadbeater's possum, using non-invasive monitoring technique to track hormone activity. The goal of this project is to gain insights of glucocorticoids' effects in reproduction, diet and husbandry in the Leadbeater's possum therefore enhancing and refining their captive breeding success and management.

Human disturbance has pushed the critically endangered Leadbeater's possum (*Gymnobelideus leadbeateri*) to the brink of extinction, demanding ongoing action for its conservation. Captive breeding programs offer a tool for supporting *G. leadbeateri* recovery, however these efforts face challenges, including achieving high reproductive success. Non-invasive hormone monitoring via faecal glucocorticoid metabolites (FGMs) can provide valuable insights into health, reproduction and management. Glucocorticoids, while primarily recognized as stress hormones, also play a critical role in healthy reproduction and female cycles. Using a validated enzyme immunoassay, we characterised 1) FGM patterns throughout the reproductive cycle in six female *G. leadbeateri* and 2) FGM differences between lowland and highland possum populations. FGMs were elevated during the luteal phase of the reproductive cycle, coinciding with increased progesterone levels. Notably, highland females showed a greater increase in FGM concentrations during the luteal phase than lowland females. All four highland females subsequently bred successfully, whereas the two lowland females did not breed, indicating that a greater FGM increase during the luteal phase may be associated with positive reproductive outcomes. This knowledge aids refinement of the management and future success of captive *G. leadbeateri* and lays the foundation for advancing reproductive knowledge and success in other endangered species worldwide.

DO DINGOES INFLUENCE GOAT POPULATION SIZE IN A SEMI-ARID PASTORAL REGION OF WESTERN AUSTRALIA?

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Zali Jestrimski (she/her) is a PhD candidate at the University of Sydney with a keen interest in rangeland ecology. Her current research focuses on the history of dingoes in a remote pastoral region in Western Australia and the potential flow-on ecological effects of dingo population fluctuations over time. The project involves a combination of fieldwork, social science and archival data collection to explore localised mammal and vegetation composition changes over time in the study region on Wajarri Yamatji Country and Nanda Country.

Goats are introduced to Australia and have diverse social and ecological implications such as biodiversity loss, impacts on native vegetation and competition for livestock resources, as well as profit values through commercialisation. Though management of goats in rangeland systems varies depending on conservation, production and economic goals, the reduction or eradication of goats is aimed for in much of Australia and successful control programs can be challenging.

We aimed to explore the impact of the re-establishment of dingoes (ngubanu; Wajarri Language) on the feral goat population in a pastoral region in the Southern Rangelands of Western Australia.

To assess species presence through time, archival records and semi-structured interviews were used. Interview participants had extensive local knowledge and combined experience on pastoral stations across approximately 60 percent of the study region. We used thematic analysis to develop themes associated with changes in dingo and goat occurrence and management over time and compared these with environmental and economic variables.

Our datasets depict dingoes as widespread until the mid-twentieth century but then their population size reduced, potentially to the point of extirpation, until around 2000. In the decade following the re-establishment of dingoes, goat populations declined, and they are now considered rare in the region. Presence of dingoes was more strongly associated with this goat population decline than other factors assessed.

DECODING DEVIL REPRODUCTION: NON-INVASIVE IDENTIFICATION OF LACTATION BIOMARKERS TO REFINE BREEDING MANAGEMENT OF TASMANIAN DEVILS

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Phoebe Rynehart (she/her) is completing her Honours year at La Trobe University, in the Wildlife Conservation and Reproductive Endocrinology Laboratory (WiCRE). The aim of her project is to find biomarkers of lactation in Tasmanian devils, as a sign that a female has successfully given birth. Using non-invasive endocrine techniques, the goal of this study is to identify these biomarkers with no impact on the animal. This will be a valuable tool to refine conservation breeding success and management.

The Tasmanian devil (*Sarcophilus harrisii*) is an iconic endangered Australian marsupial and is under threat of extinction. To support its conservation, organisations across Australia have established a collaborative, robust insurance population; however, questions remain. A critical challenge is how to quickly and non-invasively detect whether a female has successfully given birth, to aid husbandry and breeding management decisions. This study investigates the use of faecal samples to profile endocrine biomarkers to signify the onset of lactation. Samples were collected from 19 breeding females following both successful and unsuccessful pairings, as well as from individuals that were not paired. Concentrations of estradiol, progesterone, and corticosterone were assayed, and hormone profiles were compared across a 28-day period postpartum and between the proestrus phase and the lactation period. By establishing a biomarker of lactation we will be able to identify if a female devil has pouch young faster than current methods, and by using non-invasive samples collected during routine husbandry. This approach will offer keepers an efficient, hands-off tool to assess reproductive status, enhancing the management, welfare, and conservation outcomes for the species.

INTEGRATING THE MANAGEMENT OF TOTAL GRAZING PRESSURE AND TOTAL PREDATION PRESSURE FOR MAMMAL CONSERVATION.

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The management of invasive predators for Australian mammal conservation is often applied at the species level, for example the Feral Cat Threat Abatement Plan. However, it is predation *per se* rather than predation by a particular predator species that can impact upon fauna. Total Grazing Pressure (TGP) is an accepted concept commonly applied to sustainable land management and environmental stewardship in the Australian rangelands. The management of TGP concentrates on mitigating the combined partitioned and overlapping impacts of native and introduced herbivores on vegetation, primarily for agricultural production but also for floral biodiversity conservation. Any faunal biodiversity conservation benefits are assumed to flow from vegetation changes attributable to TGP management. However, the concurrent pressures of predation on mammal biodiversity and abundance are rarely mentioned, leaving a vacancy in ecological conceptualisation. Total Predation Pressure (TPP) is the faunal analogue of TGP, which we introduce as the combined impacts of native and introduced predators on faunal biodiversity and abundance. Here we: define and contextualise TPP; conceptualise how TGP and TPP interact affecting anthropogenically altered ecosystems; consider how co-management of TGP and TPP could benefit mammal populations and faunal biodiversity; and argue that concentrating on managing single species, while often practically, economically and logistically easier, can perversely affect conservation attempts.

MOTH TRACKER CITIZEN SCIENCE: USING PEOPLE POWER TO AID THE CONSERVATION OF THE MOUNTAIN PYGMY-POSSUM AND BOGONG MOTH

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As the Senior Conservation Biologist for Zoos Victoria, **Dr Marissa Parrott** (she/her) works across Healesville Sanctuary, Werribee Open Range Zoo, Melbourne Zoo, Kyabram Fauna Park and numerous field locations to improve threatened species conservation, reintroduction and captive breeding success. She leads Zoos Victoria's threatened small mammal team and endocrinology and biobanking programs, and her research includes reproduction, behaviour, emergency management and citizen science. She has been involved in a variety of wildlife and conservation programs across Australia, Asia, Africa, the Americas and Antarctica. Marissa has been named as an Australian Science Hero by the Office of the Chief Scientist, was part of the largest ever all-woman expedition to Antarctica in 2019 with Homeward Bound, and is the current Vice-President of the Australian Mammal Society. Marissa sits on and leads a number of Threatened Species Recovery Teams, plus international specialist groups, and has a strong focus on endangered native marsupials, rodents and frogs to aid Zoos Victoria's commitment that no Victorian terrestrial vertebrate species will ever go extinct.

The future of Australia's mammals and invertebrates is intricately linked, as showcased by the relationship between the critically endangered Mountain Pygmy-possum (MPP; *Burramys parvus*) and migratory, endangered Bogong Moth (*Agrotis infusa*). Following decades of decline, and then a devastating drought, Bogong Moth numbers collapsed by an estimated 99.5% in 2017 and 2018. This catastrophic decline also affected alpine species like the MPP, which rely on the moths for nutrition, leading to starvation and the loss of pouch young. In response, Zoos Victoria launched its citizen science initiative, Moth Tracker, in 2019 to enlist the support of Australia's community to: 1) gather data on Bogong Moth locations, migration and numbers, 2) provide an early indication of low moth years to allow planning for MPP mitigations, such as supplementary feeding, and 3) raise awareness of the plight of the MPP and the frequently misidentified Bogong Moth. Since its inception, over 6000 sightings have been submitted on the Moth Tracker website from all Australian states and territories. Each submission is individually verified by Zoos Victoria as a Bogong Moth or other species, and verified submissions of Bogong Moths have increased from 28% in 2020, to 58% in 2024. Moth Tracker's promotion via communities, media and 60+ partners has raised the profile of both species, reaching millions of people per year. This program highlights the power of citizen science to gather data, raise two species' profiles, and aid conservation, especially for species which may be difficult to study when migrating over wide areas.

OVARIAN CHANGES DURING PREGNANCY AND EARLY EMBRYO LOSS IN THE POOKILA (*PSEUDOMYS NOVAEHOLLANDIAE*)

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Understanding the reproductive potential of a threatened species facilitates conservation outcomes, particularly when animals are reintroduced from captivity to former ranges. Twelve non-lactating females were sampled during gestation and shortly following parturition in a laboratory colony sourced from wild-caught animals from NSW during the 1970s. Serial sections of ovaries and oviducts were examined by light microscopy and their corpora and Graafian follicles measured and described. Corpora lutea of pregnancy more than doubled their diameter during three periods of gestation: rapid growth from Day 1 (mean 503 µm) to Day 4 (782 µm), a plateau from then until Day 14 (757 µm) and rapid growth until near-term at Day 29 (1136 µm). Luteal cell and nucleus diameters increased rapidly in the second half of gestation. At 6 days post-parturition, CL measured 648 µm. Histological changes in CL and Graafian follicles followed the murid rodent pattern. By comparing the number of CL of pregnancy to macroscopically visible embryos in each female, embryo loss was estimated at 7%. Mean number of these CL was 5.1 and macroscopically visible embryos was 4.7, compared with a colony mean litter size of 4.0, thus indicating loss at multiple stages of gestation. Graafian follicles were present throughout gestation (except Day 1) with maximum numbers (10) at mid- and late-gestation. Atretic vesicular follicles were present throughout gestation. The ovary of pregnant *P. novaehollandiae* shows similarities and differences compared with the general murid pattern and *Notomys alexis*, the only other detailed study of the ovary of an Australian rodent.

A NEW LOOK AT A MISSING OLD-WORLD FLYING-FOX FROM PERCY ISLAND (*PTEROPUS BRUNNEUS*)

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Percy Island Flying-fox (*Pteropus brunneus* Dobson, 1878), was endemic to Percy Island off central Queensland and features among the long list of Australian mammals extinct since European colonisation. It is known only by the holotype (a cranium, mandible and dried skin) collected sometime between 1854–1874 during the voyage of HMS Herald. We considered the confinement of a species of flying-fox to Percy Island remarkable, given the island lies just 50 km from the Australian mainland. Moreover, HMS Herald voyaged extensively through parts of the South-west Pacific prior to pausing briefly at the Percy Isles. We examined the holotype and compared it with other *Pteropus* species that occur in the region visited by HMS Herald to take a fresh look at the identity of this species. Using comparisons of craniodental and external variables we cast doubt on the identity of *P. brunneus* as an Australian endemic. We recommend genetic data to reaffirm our conclusions, and list some of the significant implications for flying-fox nomenclature and Australian mammal conservation.

SOURCE, SAMPLES, AND SURVIVAL- THE IMPACT OF SOURCE POPULATION TRAITS ON THE SUCCESSFUL TRANSLOCATION OF THE BRUSH-TAILED BETTONG (*BETTONGIA PENICILLATA*) INTO A PREDATOR SUPPRESSED LANDSCAPE.

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Between 2021 and 2023, 193 brush-tailed bettongs (woylie/yalgiri; *Bettongia penicillata ogilbyi*) were reintroduced to Dhilba Gurrindah–Innes National Park (DGINP) on the Yorke Peninsula, South Australia. DGINP supports supressed, but not eradicated, populations of introduced predators (primarily feral cats, *Felis catus*, and red foxes, *Vulpes vulpes*). Translocated bettongs were sourced from five source populations: two wild and two safe havened populations from Western Australian, and an isolated island population from South Australia.

This study used data collected at translocations and during the 17 months post release to assess how source population traits influenced post-release survival and reproduction. In particular, we investigated genetic diversity and microbiome composition —both gastrointestinal (oral, cloacal, faecal) and reproductive (pouch)— the first characterisation of the yalgiri/woylie microbiome.

We estimated survival at a source population level, 7- and 17-months post-translocation, and found that survival likelihood increased with time since translocation and was influenced by factors such as prior predator exposure, morphology, release group size, and landscape scale population density.

Additionally, we investigated how the ancestry of the source populations impacted the morphology and survival of progeny born post translocation. Cage trapping surveys identified over 120 yalgiri born in DGINP. Genetic analysis of these progeny indicated limited outbreeding between translocated source populations and revealed significant differences in reproductive success.

As Australia shifts its conservation translocation focus to “beyond the fence” projects, these findings enhance our understanding of how source population affects reintroduction success when translocating Australia’s mammal fauna into landscapes with invasive predators.

DECLINING BODY CONDITION ACROSS DECADES IS DRIVEN BY LOW RAINFALL AND DROUGHT IN AN ICONIC, SEMI-FOSSORIAL MARSUPIAL (*LASIORHINUS LATIFRONS*): IMPLICATIONS FOR SPECIES PERSISTENCE UNDER CLIMATE CHANGE.

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With the severity and duration of drought events predicted to increase across broad regions of the globe with climate change, there is an urgent need to understand how this will impact wildlife species. Long-term datasets are invaluable in this instance as they provide insight into how animals respond to environmental extremes. We analysed 32 years of body condition data (scaled mass index) on wild southern hairy-nosed wombats (*Lasiorhinus latifrons;* n = 2,685), a semi-arid dwelling marsupial vulnerable to drought, in southern Australia. We found that body condition was influenced by both the abundance of green vegetation (Normalised Difference Vegetation Index; $P \leq 0.001$), and rainfall ($P \leq 0.001$). Adult and subadult body condition displayed seasonal fluctuations associated with resource abundance. Body condition was negatively associated with increasing drought severity (Standardized precipitation evapotranspiration index; $P \leq 0.005$). Adult wombat body condition declined significantly, equivalent to 15% (~ 4 kg) on average for a given head width, across the 32-year study period ($P \leq 0.001$). This decline was primarily driven by decreasing annual rainfall and abundance of green vegetation and increasing drought severity at the site. Habitat degradation, common across this species' distribution, may have exacerbated this effect. With rainfall projected to continue to decline and drought severity projected to increase across southern Australia, these results highlight the serious threat climate change poses for this and other semi-arid species, including to their long-term persistence. Future research should focus on effective conservation measures, potentially including increasing habitat quality, to mitigate these negative effects.

THE UTILISATION OF AIRBORNE eDNA TO DETECT CRYPTIC SMALL MAMMALS: A CASE STUDY TARGETING THE THREATENED JULIA CREEK DUNNART (*SMINTHOPSIS DOUGLASI*).

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Jess Kelly (she/her) is an honours student at the Queensland University of Technology, assessing the utilisation of airborne environmental DNA as a detection tool for small mammals. She has completed dual degrees in biology and business management (2023) with a keen interest in phylogenetics and threatened species recovery.

Australia has the highest rate of mammal extinctions in modern times, with at least 39 species extinct and over 110 species listed as threatened. However, there are numerous mammal species where we lack sufficient population knowledge to accurately classify their conservation status. One reason for this is that many species are small, cryptic, and difficult to monitor via traditional trapping, due to high costs and logistical constraints. Over the past decades, environmental DNA (eDNA) has been successful in detecting and monitoring aquatic species. Recent advances in terrestrial eDNA collection methods have highlighted the potential of airborne eDNA (i.e., DNA from bioaerosols) as a detection tool, but it is not widely tested. Here, we aimed to investigate whether airborne eDNA can accurately detect the presence of a small mammal in an open grassland environment. Specifically, we aimed to detect the threatened Julia Creek Dunnart (*Sminthopsis douglasi*) in the Mitchell Grass downs bioregion of Queensland, Australia. This Dasyurid, once thought to be extinct, has only been patchily detected via live trapping and is known to undergo marked population fluctuations. Their small size and use of cracking clay habitat refuges present further challenges to detection. Project design and overarching goals will be discussed.

DIET ANALYSIS OF FERAL DOMESTIC CATS (*FELIS CATUS*) IN NORTH-WEST QUEENSLAND DURING A LONG-HAIRED RAT (*RATTUS VILLOSISSIMUS*) PLAGUE

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Charlotte L. Woods (she/her) is an Honours student at the Queensland University of Technology, studying a Bachelor of Advanced Science in Biological Sciences. Her research focuses on native, carnivorous marsupials (dasuyrids), particularly the Julia Creek dunnart (*Sminthopsis douglasi)*. Her research explores the impact of feral cats on native wildlife in north-west Queensland during a rodent plague. She is especially interested in how predator diets shift and what that means for the threatened Julia Creek dunnart. Charlotte is passionate about wildlife conservation and using field-based data to inform management strategies for threatened species.

Predation by feral domestic cats (Felis catus) presents an extinction risk to native critical-weight-range mammals in Australia, including the threatened Julia Creek dunnart (*Sminthopsis douglasi*). This study investigates the dietary composition of cats harvested monthly across 2024 from properties near Julia Creek known to support *S. douglasi*, to assess the extent of their predation on small vertebrates. Much of the shooting occurred amidst a native long-haired rat (*Rattus villosissimus*) plague, which began to subside towards the end of the program. In the first month, 200 cat stomachs were collected. Subsequently, 50 were collected monthly at the eradication site and 10 at a control site, with camera traps monitoring changes in cat and small mammal abundance at both sites. Cat guts will be dissected, and comparative morphological analysis with museum specimens will permit an inventory of diversity and relative abundance of vertebrate prey items. The study will improve the understanding of predation patterns by cats during rodent irruptions and assess to what extent *S. douglasi* forms a dietary component during such periods. It will provide baseline information that will be combined with ongoing cat gut collections from these sites during 2025, to determine if prey-switching occurs as rodent numbers crash.

DO POOKILA PERSIST IN QUEENSLAND?

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Abby Dennien (she/her) is a PhD candidate and casual academic at the University of Southern Queensland. Her research aims to better understand Pookila populations in Queensland. Prior to her obsession with rodents, she completed her Honours degree at the University of Southern Queensland trialling a new feral cat management method and has worked with a range of native species both in the field and in captivity.

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Australian rodent species have experienced disproportionately high rates of extinction and continue to face significant declines. The Pookila (New Holland mouse; *Pseudomys novaehollandiae*) is a prime example of a threatened native rodent species experiencing significant range contraction. Previous research has primarily focused on the southern Australian populations and their decline. As a result, little is known about the species' distribution, status, or ecology in Queensland. This research aimed to conduct the first targeted survey of Pookila in Queensland to assess their current distribution within the state and address the knowledge gaps surrounding their ecology. We surveyed previous Pookila capture locations using live traps over a 16-month period from 2023 to 2024, which failed to detect any Pookila. These results provide the first assessment of Pookila in Queensland and suggest either a potential local population decline or significant fluctuations. Additionally, it highlights the difficulties of surveying small threatened species, which paired with inadequate species knowledge, can hinder conservation efforts for such species. Further long-term surveys are required to clarify population trends and see the inclusion of additional monitoring techniques to improve the detectability of the species in Queensland. Our work highlights the importance of targeted and ongoing surveys for threatened rodent species. If localised declines are occurring, this has implications for the persistence of the species in Queensland and contributes to the growing national concern for Pookila.

PROPOSAL TO DEVELOP AUTHORITATIVE DISTRIBUTION MAPS FOR ALL AUSTRALIAN MAMMALS – AN UPDATE

Milne, Damian.

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Authoritative distribution maps are not readily available for most Australian mammals. Existing maps are often small-scale, static and have limited detail (e.g. field guides, Mammals of Australia). They are not designed for dynamic use in research, conservation planning, or environmental assessment. One exception is BatMap (https://www.ausbats.org.au/batmap.html), which has successfully developed dynamic, expert-reviewed distribution maps for all 80 species of mainland Australian and Tasmanian bats.

At the 2024 Australian Mammal Society Conference, I presented a proposal to develop and maintain authoritative distribution maps for all Australian mammals. The project would utilise the collective expertise of members of both the Australian Mammal Society (AMS) and Australasian Bat Society (ABS), and would be jointly administered by both societies. BatMap could serve as a model for the design and governance of the initiative. The purpose of the presentation was to gauge the level of support for the project.

The proposal received positive feedback from AMS Conference attendees and from the ABS more broadly. Since then, I have developed project roadmap and draft plan describing all key aspects of the project. The plan is currently being reviewed and considered by the governance committees of both the AMS and ABS.

EVIDENCE THAT THE SHORT BEAKED ECHIDNA IS NOT A SPONTANEOUS OVULATOR

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In the wild, trains of male echidnas are often observed following females during the breeding season but the reason for this is unknown, and until recently, echidnas have been challenging to breed in captivity. The timing and occurrence of oestrous cycles was evaluated between paired and unpaired short-beaked echidnas (*Tachyglossus aculeatus aculeatus*) to explore whether the short-beaked echidna is a spontaneous ovulator to better understand the reproduction of this species. Faecal samples were collected three times a week during the breeding season (June to late August 2023) from four females paired with males, four females housed individually but adjacent to males and two females housed individually. Faecal samples were weighed (0.2 g) and extracted with 5 mls of 80% methanol overnight before analysis using a progesterone enzyme-immunoassay previously validated for the species. Significant increases in faecal progesterone metabolite (FPM) levels were detected in three of the females paired with males confirming ovulation and subsequently verified by the successful production of an egg. In the fourth female paired with a male, FPM levels were elevated for an extended period of approximately four weeks suggesting atypical ovarian activity. In all six female echidnas not housed with males, no significant increases in FPM were detected. These results provide evidence that ovulation in the echidna is either an induced by coitus/semen or occurs after male-presence induced oestrus. As a solitary species, both induced ovulation or male-induced oestrus would have benefits as a reproductive strategy to increase the likelihood of successful reproduction during the short breeding season. This new knowledge will assist in better understanding the requirements of reproductive success for echidnas both *in situ* and *ex situ*.

CONTEXTUALIZING THE DIETARY ECOLOGY OF *CANIS DINGO*: A DENTAL MICROWEAR COMPARISON ACROSS CONTINENTS

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Understanding the dietary ecology of mammals is critical for reconstructing past ecosystems, evaluating ecological flexibility, and informing conservation efforts. Dental microwear texture analysis (DMTA), a quantitative method that assesses microscopic tooth wear resulting from food processing, offers key insights into extant and extinct mammals over time. By quantifying surface textures such as anisotropy (*epLsar*) and complexity (*Asfc*), DMTA can distinguish between dietary behaviors that are often cryptic using traditional morphological approaches—including identifying carcass utilization and/or scavenging behavior in carnivores. Application of DMTA to modern museum specimens of *Canis dingo* reveals remarkable dietary adaptability, with high variability in surface textures indicative of both pursuit predation and scavenging—consuming varying amounts of flesh and bone across diverse environments. In contrast, DMTA of *Canis lupus* from around the globe and at the Rancho La Brea tar pits (California, USA) during the Pleistocene, shows dietary consistency over millennia, with wear patterns reflective of active predation on large-bodied herbivores and more constrained dietary flexibility. These differences underscore their ecological distinctiveness, supporting arguments for species-level separation under the ecological species concept. DMTA attribute values of *Canis dingo* overlaps the entire “microwear space” of all canids—exemplifying their generalist dietary behavior that is observed today. Lastly, their broad dietary niche is not synonymous with domestication, as dogs in North America are much more “wolf-like” in their dietary behavior.

MASS DEATH ASSEMBLAGE OF PLEISTOCENE MEGAFAUNA (*DIPROTODON OPTATUM*: MARSUPIALIA) AT DU BOULAY CREEK, WESTERN AUSTRALIA

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Discovered in 1991, the Du Boulay Creek fossil locality in the Pilbara is one of the most northern fossil localities in Western Australia containing *Diprotodon optatum,* the largest marsupial that existed. A near complete skeleton was recovered over two expeditions in 1991 and 1992 by the Western Australian Museum (WAM), which is still today the most complete skeleton found in the state. Two other partial skeletons were also recovered by the WAM. Luminescence dating of sediment adhering to one of these specimens has proven unreliable due to partial bleaching of grains; it remains possible that the fossils are >80,000 ka. In collaboration with Citic Pacific Mining, the WAM returned to the site in 2022 for new surveys when 10 additional partial skeletons were discovered, including the first two skulls found at the site. An excavation was undertaken in 2023 and 2024 to recover some of these, with the aim also to study the taphonomy of the site and collect new materials for dating including U-series that will allow us to direct date the fossils, as well as in-situ sampling of sediments for optically stimulated luminescence (OSL) dating. The site is unusual in the presence and abundance of individuals of a single species, which may tell us more about the biology of *D. optatum*. The taphonomic assessment of the site will help us understand how the individuals were accumulated in the creek and test if the individuals died in-situ or were washed in during floods possibly as bloated carcases caught-up in mangroves.

TWO YEARS AFTER MAJOR FLOOD, TERRESTRIAL FLOODPLAIN FAUNA HAVE NOT RECOVERED

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Extreme flood events can have devastating effects on small faunal species that rely on floodplain habitat. The 2022-23 Murray River flood was the largest flood event in ~50 years, and flooded land included Reny Island on Calperum Station; a river-locked island within a South Australian internationally significant (RAMSAR-listed) wetland system. We compared the occurrence of the two most commonly occurring floodplain species in this ecosystem before (2019-20) and after (2025) catastrophic flooding; a small terrestrial marsupial (fat-tailed dunnart; *Sminthopsis crassicaudata*) and a small terrestrial reptile (tesselated gecko; *Diplodactylus tessellatus*). Both species showed preference for blackbox woodland habitat (Reny Island) prior to flooding. Post-flood, fat-tailed dunnart were not detected in blackbox woodland, and detection rates in chenopod shrubland and erosion scalds did not change. Tesselated gecko numbers decreased, though persisted in blackbox woodland (Reny Island), and detection rates in chenopod shrubland and erosion scald remained relatively similar to pre-flood. Two years post-flood, the habitat features less vegetation cover, more bare ground, and this observation pairs with overall less vertebrates recorded, including less tessellated gecko and no fat-tailed dunnarts.

MANAGING POOKILA THROUGH FIRE AND DROUGHT

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Dr Phoebe Burns (she/her) is a threatened species ecologist with over a decade of experience researching and managing endangered mice. Her work focuses on developing management strategies and interventions to help conserve endangered native rodent species such as the Pookila and Smoky Mouse. This encompasses long-term monitoring programs, translocations and reintroductions, genetic rescue, and fire and habitat management. Phoebe chairs the National Pookila (New Holland Mouse) Recovery Team and the National Smoky Mouse Recovery Team, and is a member of the National Broad-toothed Rat Recovery Team. She enjoys working collaboratively with land management agencies, Traditional Custodian groups, students, and other scientists to design, implement, and adapt effective on-ground recovery actions.

Through habitat loss and fragmentation, introduced predators, drought, and fire, many populations of the genetically distinct and endangered Victorian lineage of the Pookila (New Holland Mouse; *Pseudomys novaehollandiae*) have been lost in the past 50 years. Remaining populations have low genetic diversity, increasing susceptibility to ongoing decline and reducing resilience to significant disturbance events such as severe wildfires and a changing climate. Conservation breeding, reintroductions and genetic rescue are underway in Victoria to support the species, nevertheless, maintenance of appropriate habitat in the wild remains key to the species' persistence.

Over the past decade, remnant Victorian populations have experienced repeated extended periods of drought, with populations exhibiting dramatic declines in response. During this period, one of the key Victorian populations of Pookila at Gippsland Lakes Coastal Park also endured a severe wildfire which impacted approximately 60% of the park and population. Compounding threatening processes and events such as these, pose a significant risk to fragmented populations of species such as the Pookila and highlight the importance of habitat management for species conservation.

Management of Pookila habitat includes planned burning to support habitat suitability and plant species diversity, as well as to reduce the risk and impact of wildfires. However, with a drying landscape, historic fire prescriptions may no longer be suitable for management of occupied Pookila habitat. We present our findings from Pookila population monitoring before and after droughts, planned burns and wildfires, exploring the relationship between rainfall and fire response, and outline guidelines for fire management for the Pookila.

THIS IS NOT ROCKET SCIENCE: CAN ARTIFICIAL TREE CAVITIES PROVIDE POPULATION SUPPORT TO HOLLOW-DEPENDENT MAMMALS?

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Forests and woodlands in Australia contain an array of arboreal mammals that depend on tree hollows for their survival. However, hollow-bearing trees have been reduced in abundance in many areas due to logging, agriculture and mining. Hollows typically take >100 years to develop, leaving an enormous lag time between an activity that depletes hollows and natural renewal. One solution is to install artificial cavities in the form of nest boxes and/or hollows carved into tree trunks. This idea has proven contentious in Australia for various reasons. Available evidence suggests the only contention yet to be rejected is whether artificial cavities can support a population of hollow-dependent mammals, either fully or in part. Up to 164 nest boxes were installed in 75 clusters (sites) across a 600-ha block of box-ironbark forest near Bendigo. Few tree hollows were adequate in size for use by groups of inland sugar gliders (*Petaurus notatus*) or maternal brush-tailed phascogales (*Phascogale tapoatafa*). Boxes were checked twice per year over six years (2018–2023). Both species experienced declines in 2019 and 2020 when only 46–51% of annual rainfall fell. In 2022 and 2023, phascogales were seen at 26–35 sites, producing 26–29 maternal nests. A total of 164–317 sugar gliders were seen at 53–58 sites. The literature suggests female phascogales use core areas of 15 ha and sugar glider groups use 2 ha. If these occurred evenly across the forest, our boxes supported 65% of 40 maternal phascogales and 18% of 300 glider groups.

CAN LIVESTOCK GUARDIAN DOGS MANAGE THE IMPACTS OF OVERABUNDANT WILD HERBIVORES?

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In many regions world-wide, overabundant populations of large herbivores are causing significant environmental and economic damage. In Australia, species like kangaroos and deer can damage natural environments and farm landscapes. Conventional management approaches—including exclusion fencing and lethal control—are often costly, of limited effectiveness, and may be socially unacceptable. A low-cost, non-lethal alternative is needed.

Our previous research found that Livestock Guardian Dogs (LGDs), deployed to protect sheep from dingoes, also had a significant impact on the large herbivores present in the areas where the dogs were active. The presence of LGDs appeared to elicit natural predator-avoidance behaviours in kangaroos, wallabies, and deer, causing these species to avoid areas occupied by the dogs.

Building on these findings, we have initiated a research project to experimentally test the effect of LGDs on wild herbivores. Maremma sheepdogs will be deployed in an area with abundant kangaroos, wallabies, wombats, deer, and pigs to assess their impact on the distribution and behaviour of these species. We will also evaluate whether LGDs can reduce grazing pressure from these wild herbivores, prevent fence damage, and limit damage caused by pig rooting.

If proven effective, LGDs could represent a valuable, socially acceptable, non-lethal method for managing the impacts of large herbivores in a range of contexts, including livestock pastures, riparian zones, and habitat restoration sites.

FIVE INDEPENDENT MAPS HELP FURTHER DEFINE THE DISTRIBUTION OF THE ICONIC BARE-NOSED WOMBATS *VOMBATUS URSINUS* IN NSW

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Daniel Lunney is a wildlife ecologist with a long-term interest in wildlife management and conservation, particularly forest mammals.

The bare-nosed or common wombat *Vombatus ursinus* was an unprotected species in NSW until 1974. However, uncertainty in its distribution has hampered efforts to assess possible range contractions or the reasons for the limits of its distribution. The aim of this study was to concentrate on the fundamental ecological dimension of wombat distribution in NSW by synthesising ecological, social and welfare distribution data. We created five maps from independent datasets of wombat distribution in NSW: locations made over three decades (1968-1999) by John McIlroy; 'Wildcount' camera survey in protected areas in the period 2012-2021; locations of where licences have been issued to harm wombats; the location of rescued wombats; and a major state-wide community survey conducted in 2006. Collectively, the results identify that the distribution covers south-east NSW in a roughly rectangular shape south from about Newcastle along the coast to the NSW-Victorian border, then inland to the western slopes of the Great Dividing Range. This forms almost the entire distribution in NSW. There is a northerly extension along the ranges. We have now produced a series of reliable maps of the current distribution of the bare-nosed wombat, which is consistent with the recent maps of two fellow researchers. This provides confidence that there is now a reliable distribution of the bare-nosed wombat in NSW. This study has illustrated the use of spatial datasets from diverse sources to resolve the distribution of a species where there are human-wildlife conflicts and scientific uncertainty as where a species might be found.

SMOKY MOUSE, *PSEUDOMYS FUMEUS*, AFTER THE 24/25 GRAMPIANS-GARIWERD FIRES

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Once widespread from western Victoria to the ACT, populations of the endangered Smoky Mouse now tend to be small and fragmented. Local extinctions in the ACT, Otways, and Far East Gippsland have led to increasingly isolated populations and loss of genetic diversity. The populations in the Grampians-Gariwerd of western Victoria are the most isolated, being ~350 km from the nearest extant population in the Yarra Ranges of the Victorian Central Highlands. This isolation is reflected in their genetic distinctiveness and lower genetic diversity. Within the Grampians, surveys at 415 sites since 2012 have localised Smoky Mouse to clusters of a few localities spanning <10 km of the Victoria Range in the west and the Mt William Range in the east. Although these ranges are ~25km apart, genetic data indicate that Smoky Mouse from these areas are effectively isolated. Both populations are at higher risk due to low genetic diversity and high levels of inbreeding compared to all other populations of Smoky Mouse. All known Smoky Mouse records in the Mt William Range and Victoria Range were devastated by the Yarram Gap and Wallaby Rocks fires that collectively burned over 135,000 ha (80% of the Park) from December 2024 to February 2025. Here we report on the persistence and status of Smoky Mice in the Grampians-Gariwerd National Park following these fires and our collective work over the last 13 years to study Smoky Mouse in the Park.

UNDERSTANDING POOKILA SUBPOPULATION BASELINES IN NEW SOUTH WALES AND TASMANIA

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Nadia (she/her) is currently employed as Zoos Victoria's Pookila Field Officer. The main focus of this role is to undertake a two-year project to reassess the status and health of Pookila subpopulations in NSW and Tasmania. Prior to this role, Nadia also undertook a 12-month internship with Zoos Victoria's Threatened Species team, which is where her journey with the Pookila began, and she has been smitten with these lovely little rodents ever since.

The Pookila (New Holland Mouse; *Pseudomys novaehollandiae*), a small, native, burrowing rodent, is patchily distributed from Tasmania to south-east Queensland and is known to have undergone substantial declines in Victoria since 1975. Knowledge gaps about the status of subpopulations in New South Wales (NSW) and Tasmania are hampering efforts to prioritize conservation actions for the species in these states. This project aims to assess the persistence of Pookila populations in NSW and Tasmania, evaluate their genetic health, and identify key habitat requirements.

Broad scale camera trapping was used to survey for extant populations in areas where the species had not been recorded in decades, with habitat structure surveys undertaken opportunistically at camera sites. Elliott live trapping is now underway at positive camera detection sites and genetic samples are being collected for analysis.

In NSW, Pookila were detected on 21 cameras, across six different parks/reserves, including areas where the mice had not been detected in 30 years. To date, Pookila have been successfully captured at two of the three parks targeted in NSW. No Pookila were detected on cameras on mainland Tasmania, however, live trapping will occur on Flinders Island to collect more genetic samples from these populations.

This project is funded by the Australian Government Saving Native Species Program, and delivered in collaboration with the National Pookila Recovery Team. Results of this project will provide crucial information to aid in conservation planning for the Pookila across its entire distribution.

THE RISE AND FALL AND RISE AGAIN OF BRUSH-TAILED ROCK-WALLABIES IN THE GRAMPIANS RANGES, VICTORIA

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The Brush-tailed Rock-wallaby (*Petrogale penicillata*) was once broadly distributed from southern Queensland to Victoria. Many local extinctions have occurred since European colonisation, particularly in the south of the range, and extant populations are subject to ongoing, synergistic threats. The species is listed as *Vulnerable* nationally and *Critically Endangered* in Victoria. The distribution of the species in Victoria is quite disjunct, with only one population in East Gippsland and another in Grampians (Gariwerd) National Park, 550 km to the west. The presence of the species at Red Rock in the Grampians was confirmed in the 1970s. Surveys in the 1980s found signs of former occupation throughout the Grampians, and in rocky outcrops further west, but no other extant colonies. In 1999, the last known rock-wallaby in the Grampians was trapped and taken into the captive breeding program but failed to produce offspring. The species was reintroduced to the park in 2008: 39 rock-wallabies were released at Moora Moora over a 4-year period, supplemented by two unrelated males in 2020. Despite high mortality, this small colony has persisted. In early 2025, wildfire burnt over two-thirds of the park and was particularly intense at Moora Moora. A number of rock-wallabies survived the fire and are being provisioned with supplementary food and water. During a lull in the fire, a second colony was discovered 15 km away at Assess Ears, although its origin and size are yet to be determined. Further reintroductions to Red Rock and other sites are planned for 2026.

QUOLLITY MONITORING METHODS

Woodiss-Field, Sarah, Fox, Kerryn, and Holmes, Floyd.

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Sarah Woodiss-Field is an Ecologist working for Phoenix Environmental Sciences. Sarah has a keen interest in monitoring of conservation significant species, having conducted monitoring programs for numerous species including both the Northern and Western Quoll.

Effective management of conservation significant species, in areas subject to developments, requires robust monitoring of population dynamics, health metrics, and habitat use. Recent studies from the Pilbara suggest camera trapping is a more effective and less invasive method for monitoring Northern Quolls (*Dasyurus hallucatus*) compared to traditional physical trapping methods.

Phoenix Environmental Sciences (Phoenix) undertook Chuditch / Western Quoll (*Dasyurus geoffroii*) monitoring in south-west WA. The purpose of this work was to inform management practices, aid in assessment of threats, and provide baseline data to be used to detect changes in population trends.

This provided us with an opportunity to compare results of different methods for monitoring quolls, and aid in the refinement of field procedures to optimise management outcomes. The surveys included both physical trapping (cage traps) alongside a comprehensive camera trap array.

The findings indicate that the preferred methods used for Northern Quoll also apply to Chuditch, offering a scalable and efficient alternative to physical trapping that yielded more robust population estimates and was both cheaper and less invasive for the animals. Noting that physical trapping remains valuable as a method for answering specific questions relating to physical condition and sex determination.

THE POWER OF THE PITFALLS: DOES INCREASING SAMPLING EFFORT INCREASE POWER IN PITFALL SURVEYS?

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Dr Amy Edwards (she/her) joined the Practical Ecology, Science and Technology (PEST) research group at University of New England in 2019. Amy splits her time between UNE and NSW National Parks and Wildlife Service, where she is a project officer and western site leader for the Environmental Trust's Major Project: Developing Effective Management Strategies for Feral Cats. Amy's research within the PEST research team focusses on the response of native marsupials to feral cat predation, as well as monitoring the general trends of introduced and native species in the central mallee region of NSW. Amy's previous research has focussed on reproductive ecology of mammals, including undertaking the first double labelled fluorescent in-situ hybridization on marsupial sperm and comparisons with offspring birth sex ratios. Amy's favourite marsupials are swamp wallabies, and all things dasyurid!

Monitoring the distribution and abundance of animal populations is imperative for our understanding of the current state of our systems, and their changes over time. Research often focuses on methodological advancements, modelling and statistical approaches, as well as minimising costs and intensive labour. It is imperative that an accurate balance is found between minimising costs and labour without compromising the quality of the data obtained; methods must maintain an appropriate level of power with regards to the conclusions being drawn. Without sufficient power, incorrect or misleading conclusions could have significant impacts on the conservation and survival of species. Detectability of cryptic/low density species is a common theme in conservation biology and presents many issues. When false absences (undetected species that are actually present) occur, we are led to underestimates of true levels of occupancy, which can result in serious consequences for habitat models. Here, I present data from a large, multi-year pitfall survey undertaken in semi-arid mallee habitat in New South Wales. We utilise power analyses and hierarchical modelling to determine whether an increase in sampling effort has impacted the conclusions drawn from our surveys. Small arid and semi-arid dwelling mammals are some of the most cryptic and difficult to monitor species, and the results of this research enhance this common theme. These species in our survey continue to present issues in terms of the power of our conclusions, despite increases in survey effort, suggesting that a multi-factorial approach may be required more often than is utilised.

CRACKING THE CASE: CRANIAL SHAPE VARIATION BETWEEN BETTONG SPECIES (POTOROIDAE: *BETTONGIA*) SUGGESTS DIFFERENT ADAPTATIONS TO HARD BITING.

Randall[1], Maddison C, **Weisbecker[1,2], Vera**, Martin[1,2], Meg, Travouillon[3], Kenny, Newman- Martin[4], Jake, Mitchell[1,2], D. Rex

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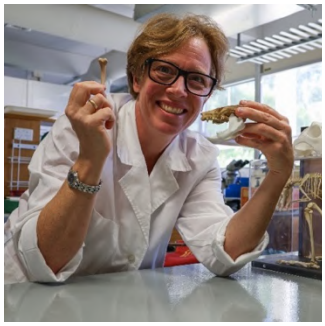

Assoc. Prof. Vera Weisbecker (she/her) is a comparative evolutionary biologist working at the interface of mammalian morphology, ecology, and palaeontology. She is particularly interested in using shape analysis to identify patterns and suspected constraints behind the diversification of Australian marsupial mammals.

Even when two groups of mammals have overall different diets, the shape of their skull can display similar adaptations if they share foods that require particularly hard bites. This can potentially lead to morphological convergence and indicates a risk of misinterpreting the diet and ecology of two species with one common hard dietary item and otherwise different diets. Our study employed geometric morphometrics to analyse shape variation among four bettong species (n=161 individuals), of which two crack the extremely hard seeds of sandalwood or quandong (*Santalum spp.*). While we indeed found adaptations consistent with hard biting in both *Santalum*-cracking species, these are not morphologically similar: the burrowing bettong *B. lesueur* has a higher mechanical advantage through a shorter face, whereas the brushtail bettong *B. penicillata* instead has a reinforced area of bone behind a shorter, chisel-like third premolar. This suggests functional, but not morphological, cranial convergence related to hard biting, possibly involving a biomechanical trade-off with a large nasal cavity in the truffle-feeding *B. penicillata*. We furthermore found substantial differences between a small number of captive northern bettongs (*B. tropica*) with wild individuals, indicative of a strong impact of captive conditions on cranial shape. Our results hint at substantial variability in how mammals with different dietary backgrounds adapt to similar, biomechanically demanding foods, and furthermore emphasizes that analysis of the entire cranium can yield insights into the dietary range of a species beyond just the hardest food.

VENTURING BEYOND FENCES: THE RAPID POPULATION GROWTH OF BILBIES REINTRODUCED TO AN EXCLOSURE

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Cass Arkinstall (she/her) is a postdoctoral researcher at the University of Queensland, collaborating with Save the Bilby Fund. Her research focuses on both wild and translocated bilby populations, with projects on post-release monitoring through to landscape-scale occupancy studies. Recently, she has been investigating the relationship between the occupancy of bilbies and introduced predators in western Queensland. This research aims to establish 'predator thresholds' for bilby persistence to help improve conservation outcomes of predator management in the region.

The distribution of the greater bilby (*Macrotis lagotis*) has significantly contracted since the introduction of feral cats and foxes to Australia. To counteract these threats, bilbies have been reintroduced to introduced predator exclosures and offshore islands. At Currawinya National Park, Queensland, bilbies were reintroduced to a fenced exclosure and the population rapidly increased from 36 founders to more than 450 individuals in just three years. Monitoring using VHF/GPS telemetry revealed high founder survival (>70% at 12 months post-release) and rapid establishment of home ranges, with both captive-born and wild-born bilbies successfully adapting to the exclosure environment. As population density increased inside the exclosure, female home ranges contracted, and reproductive output declined. These results indicate that this bilby population is limited by density-dependent factors at high densities (e.g. 17.09 bilbies km^{-2}). Bilbies are an adaptable species with high reproductive potential in the absence of introduced predators, therefore it is important to prepare for 'beyond the fence' translocations during the planning phase of reintroduction projects.

ARE YOU SMARTER THAN A BANDICOOT?

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Dr Meg Edwards (she/her) is a Lecturer in Wildlife Science at the University of Southern Queensland. She completed her Honours research in South Africa, studying the small, terrestrial vertebrates on a remote game reserve. Her PhD looked at ways to improve mammalian introduction success. She is passionate about science communication and has worked with a range of native species both in the field and in captivity. Her current research focuses on threatened species conservation and wildlife behavioural ecology.

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Bandicoots are marsupial omnivores that play a vital role in ecosystems through their foraging behaviour, promoting soil turnover, dispersal of seeds and fungal spores, and nutrient cycling. However, when it comes to predators, just how smart is a bandicoot? A range of behavioural studies indicate that some bandicoot species exhibit limited behavioural responses to both native and introduced predator cues, including olfactory and visual stimuli. Furthermore, their behaviours in captivity and during field handling display a notable lack of wariness of humans. These findings highlight the importance of conservation strategies that consider behavioural ecology of the species, to help enhance survival in increasingly threatening environments.