AUSTRALIAN Wildlife

SPRING Vol: 4/2010
$10 (non-members)

Celebrating a new century of wildlife preservation in Australia

Journal of the Wildlife Preservation Society of Australia Limited

(Founded 1909)

Tree planting day

National Tree Day was held on Sunday 1 August. More than a million native trees and shrubs were planted at over 3,000 sites around the country. This wonderful achievement is the result of the commitment and dedication of thousands of schools, community and green groups, such as the Wildlife Preservation Society of Australia, as well as hundreds of local councils who facilitated tree-planting projects in their local area.

Wildlife Preservation Society of Australia president, Suzanne Medway, was delighted and overwhelmed with the number of volunteers who turned up to plant trees in the Bicentennial Wetlands in Rockdale, Sydney.

Bunnings store at Rockdale donated a "tree planting pack" to each child, consisting of gloves, apron, fork and spade.

In all, over 60 people planted the trees donated by Rockdale City Council, including parents and children from the St George TAFE Children's' Centre. A delicious BBQ followed the tree planting.

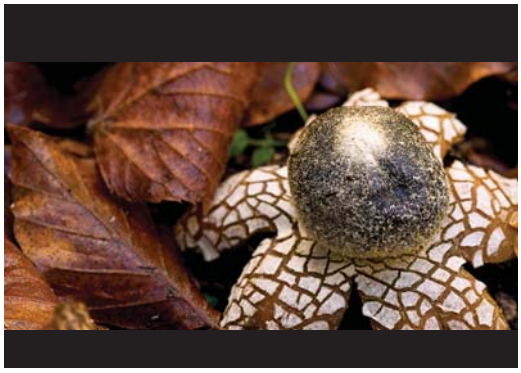
At the conclusion of the tree planting and BBQ St George TAFE Children's' Centre presented a certificate of appreciation to the Wildlife Preservation Society of Australia for organising the day, and to Peter and Robyn Stock for cooking the BBQ. Each child was also presented with a thank you certificate for participating in National Tree Day.

Our Society has been participating in National Tree Day and planting trees in this location for the past eleven years. The original trees (swamp mahogany) are now over six metres high and flourishing. Australian wattle trees planted three years ago have flowered this year for the first time around the Brighton Ponds.

Contents

features

regulars



Front cover and back cover

Astraeus hygrometricus, commonly known as the hygroscopic earthstar, the barometer earthstar, or the false earthstar, is a species of fungus in the family Astraeaceae. In maturity, it displays the characteristic earthstar shape that is a result of the outer layer of fruiting body tissue splitting open in a star-like manner. Its common names refer to the fact that it ishygroscopic (water-absorbing), and can open up its rays to expose the spore sac in response to increased humidity, and close them up again in drier conditions. (Photo by Michael Williams, It's a Wildlife - Nature and Wildlife Photograph Pty Ltd)

WILDLIFE PRESERVATION SOCIETY AUSTRALIA

Celebrating a new century of wildlife preservation in Australia

Australian Wildlife

is the official journal of the Wildlife Preservation Society of Australia Limited.
Founded in 1909, the Society is dedicated to the conservation of our unique Australian wildlife in all its forms.

Print Post Approval No: PP243459/00117

Price $10 (for non-members)

Membership

Individual Members: $50

Family Members: $65
(being husband, wife and children jointly)

Concession: $45
(pensioner, student, child)

E-mag Members: $25
(Australian Wildlife magazine will be distributed via email as a pdf document - no hard copy of the magazine will be sent)

Associate Members: $80
(being schools or incorporated or unincorporated associations with a principal object related to conservation, nature study or education)

Corporate Members: $120
(being incorprated or unincorporated associations not being associate members)

Three Year Membership

Individual Members: $135

Family Members: $175

Concession: $120

E-mag Members: $68

Associate Members: $215

Corporate Members: $325

Includes postage within Australia.
Add $60 for overseas postage

President

Suzanne Medway

Tel: (02) 9556 1537

Fax: (02) 9599 0000

Contact

National Office
Wildlife Preservation Society of Australia Limited

PO Box 42
BRIGHTON LE SANDS NSW 2216

Tel: (02) 9556 1537

Fax: (02) 9599 0000

Email: info@wpsa.org.au

Website: wpsa.org.au

Correspondence to:

Hon Secretary:
Wildlife Preservation Society of Australia Limited

PO Box 42
BRIGHTON LE SANDS NSW 2216

Directors 2010

Notice to our members

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

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

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

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

Our Mission

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

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

From the President's desk

Suzanne Medway - President

Australians consume more than one and a half million tonnes of plastic each year. With around one third of this plastic being used for packaging, it is no surprise that the environmental consequences of plastic packaging waste are a major concern for industry and the community.

It is a well known fact that plastic can be lethal to our native wildlife. There is one 'plastic' problem that seems to have a simple solution, yet it remains largely ignored – plastic rings on bottles.

Jars and bottles with plastic lids often now come with a plastic ring that snaps apart from the lid upon opening. If this ring is not cut open prior to disposal by a particularly environmentally aware person (of which there are very few that would even think of this), then it enters our waste system as a whole ring that has the potential to cause a slow and painful death to any one of a variety of our native fauna through strangulation, starvation, deformation, or infection.

The simple solution for responsible, environmentally aware manufacturers is to change the design of such rings that snap free from the lid upon opening, and to also snap open the ring left on the body of the bottle, so that they no longer form a complete ring. A similar design could also be implemented for the plastic rings that hold six-packs together, so that there is no way for any of these rings to stay intact when the bottles are removed. Such a slight modification would not be too much of a burden upon manufacturers for the sake of saving the agonising deaths of thousands of innocent native wildlife.

Some native wildlife species are more prone than others due to their particular habits. For example, the satin bower bird is particularly vulnerable to the blue plastic rings commonly from milk or juice bottles, as their habit of collecting blue items to attract females means that this rubbish is quite commonly seen as desirable decoration for their bowers. If the ring happens to flip over its head when the bird is holding it in its beak, it can get stuck as shown in the picture of the magpie. This then prevents the bird from eating or drinking until it either starves to death, or is lucky enough to be rescued by someone.

Pictured are a few examples of just some of the victims of these rings.

Our Society has been writing to drink and milk manufacturers for quite some years asking them to consider changing the lids of drink and water bottles to prevent this needless suffering of our precious native wildlife. A change-over to a clever design to enable the rings to snap open upon opening of plastic lids or removal of bottles from a six-pack would be ideal.

We are also lobbying our state and federal environmental ministers to introduce legislation to ensure that products with plastic rings that remain intact after opening can no longer be sold in this country.

All packaging should not be made of closed, unbreakable loops of plastic. If we cannot persuade manufactures of the danger to wildlife of this particular type of packaging, perhaps we can educate people of the problem and urge them to cut the loops before disposing.

We also urge our members to write to drink manufacturers asking them to change the design of their packaging. Our office can email a form letter that includes the photographs – a picture tells the danger a lot more graphically than words.

This quoll was found in the Huon Valley, Tasmania. It was initially thought to be a victim of roadkill, but on closer inspection found it was all caught up in a plastic six-pack holder. The quoll weighed about half the normal weight, so it had been suffering for some time with the plastic tightly wrapped around its body behind the front legs and another loop of plastic twisted around one of the front legs as well, making it impossible to free itself.

This magpie was lucky, it was found before starving to death. Many do not fare so well, and they succumb silently, in agony and out of sight.

This magpie would slowly starve to death if it had not been rescued.

This platypus entangled in a plastic ring of unknown origin was carrying the item bandolier-fashion, from in front of the right shoulder to behind the left foreleg. The rough edge of the ring had cut deeply into the skin just behind the leg, and the left front foot was badly swollen, affecting the animal's posture and movement.

This turtle has been horribly deformed as it has grown after getting this ring caught around its middle.

Know your directors

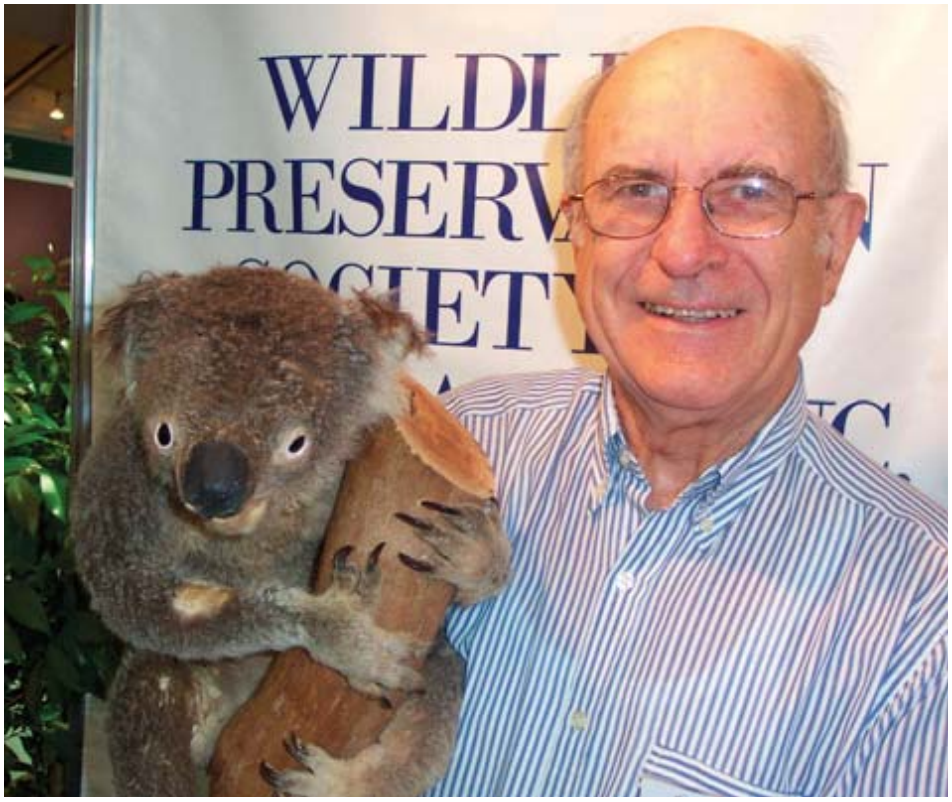
Dr Clive Williams

Vice President

Clive was a psychologist before he retired in July 2003. He was born in Brisbane and educated at Brisbane State High School. He holds a B.A. (Hons Psych.), Dip.Ed and B.Ed. from the University of Queensland and a Ph.D. from the University of Iowa in the USA. He has worked as a psychologist in Tasmania, Victoria, Queensland and New South Wales. He was the founding Director of the University of Sydney Counselling Service which provided psychological services to students and staff of the University, following 10 years at the University of Queensland Counselling Service. After seventeen years in that position Clive left the University to enter the private sector where he was Managing Director of Wilson Banwell Pty Ltd, a firm providing psychological services to the commercial sector and government departments.

Clive is a Fellow and Life Member of the Australian Psychological Society (APS) and a former President of that Society. In 2009 the College of Counselling Psychologists within the APS presented Clive with the Award of Distinction for his contributions to the discipline.

Clive has had a longstanding interest in Australian fauna and flora. He has been



a Committee member of the Wildlife Preservation Society for 20 years, a Vice-President for 10 years and a Life Member since 2005. He has always been an "urger". The AGM minutes of 1991 record that he was urging the Society to become more involved in projects otherwise it ran the risk of simply being a Society with a healthy bank balance which didn't actually do anything. Clive is widely travelled both within Australia and overseas. In his younger days he was a keen cricketer and hockey player, reaching interstate level in the latter. When he is not busying himself with wildlife activities he is involved on the committee of his local Probus Club and also is the Secretary of the Body Corporate in the block of units in which he lives.

Correction

In the Winter edition of *Australian Wildlife* the following photograph was incorrectly credited to Helen Waudby. It was actually taken by one of Helen's long-term volunteers, Katelyn Ryan.

WPSA news

Website

The Society's website is being continually updated and the latest innovation has been an addition to the members' access section. It is now possible for our members to download past copies of *Australian Wildlife* - beginning with the Summer 2004 magazine - in pdf format.

University dinner planned

We are very excited to announce that a special fund raising dinner will be held in March 2011 to launch the Wildlife Preservation Society of Australia/University of Technology Sydney Science Research Award.

The function will be held in the University Technology Sydney Function Centre and will be jointly hosted by Professor Ross Milbourne, Vice-Chancellor and President of University of Technology Sydney and Suzanne Medway, President of WPSA.

We will also be celebrating the 40th anniversary of the first environmental Green Ban in the world. Jack Mundey, original proponent of the Green Ban policy, has agreed to be our guest speaker. The Governor of NSW has been invited to be our guest of honour.

Full details and an invitation will be featured in the Summer edition of *Australian Wildlife.*

Fungi

Suzanne Medway

The United Nations declared 2010 to be the International Year of Biodiversity. It is a celebration of life on earth and of the value of biodiversity for our lives. Our Society celebrates and acknowledges Australia's biodiversity.

Australia is world-renowned for its often extraordinary and unique natural environment – including many of its plants and animals.

A remarkable aspect of our natural world – fungi – is often overlooked. Many are brightly coloured, some fluorescent; some are elegant, others squat; some are fragrant, more still are highly toxic.

Chlrovibrissea-bicolor

Hericium-coralloides

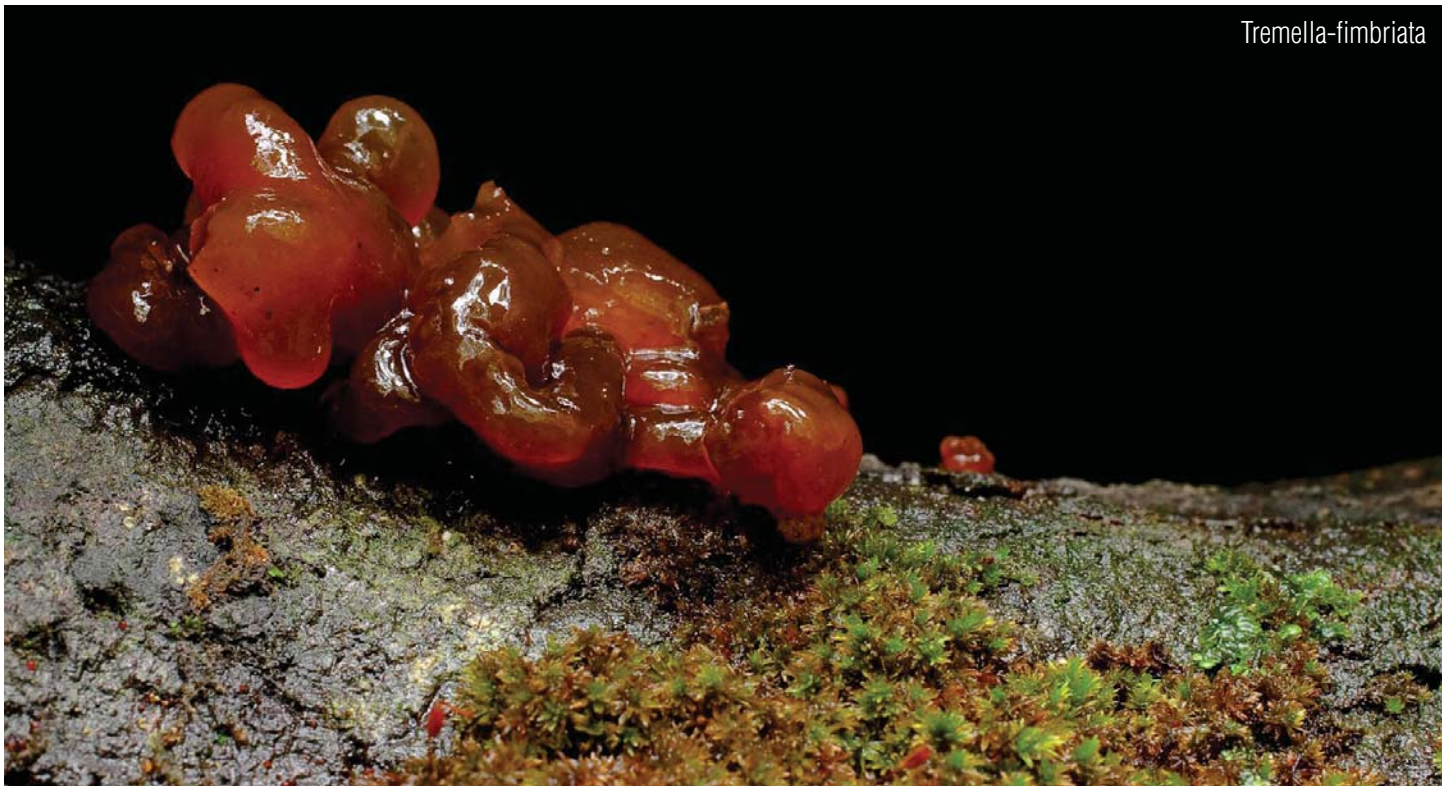
Fungi are an important group of organisms, essential to nutrient cycling and recycling, and to the health of most plants and animals. Of the estimated 250,000 species of fungi in Australia only about five percent have been described.

The fungal kingdom is thought to contain the most number of species after insects and is probably the least understood of all the organisms on the planet. Most of us are aware of the mushrooms and toadstools that we see popping up in the garden but very few are aware of the huge array of microscopic fungi that exist.

Fungi are neither plants nor animals. Lacking chlorophyll (like animals), they rely on pre-existing organic material for food. They are found everywhere around the world, from rainforest to desert, stream to ocean, and poles to the equator.

Plants, animals and fungi do not live separately in Australia's ecosystems but are strongly interlinked. Many of our plants such as eucalypts, wattles, native heaths and orchids can thrive in poor soils because they have beneficial fungal partners. Many of our native wildlife such as bandicoots, potoroos and beetles depend on fungi for their food or habitat.

Research is beginning to discover just how fungi can help reduce the likelihood of extinction of plants, animals and loss of ecological communities.



Tremella-fimbriata

Calostoma-fuscum

Mycena-interrupta

Clavicorona-sp.

Mycena-epipterygia


Marasmiellus-affixus


Ruby-mycena


Ramariopsis-crocea


Astraeus-hygrometricus

All photos kindly supplied by Michael Williams, It's a Wildlife - Nature and Wildlife Photograph Pty Ltd

University Grants 2010

The Wildlife Preservation Society of Australia University Research Grants are scholarships offered to honours or postgraduate students at Australian universities.

Each year, ten grants of $1,000 are awarded. The following articles are contributed by the 2010 winners.







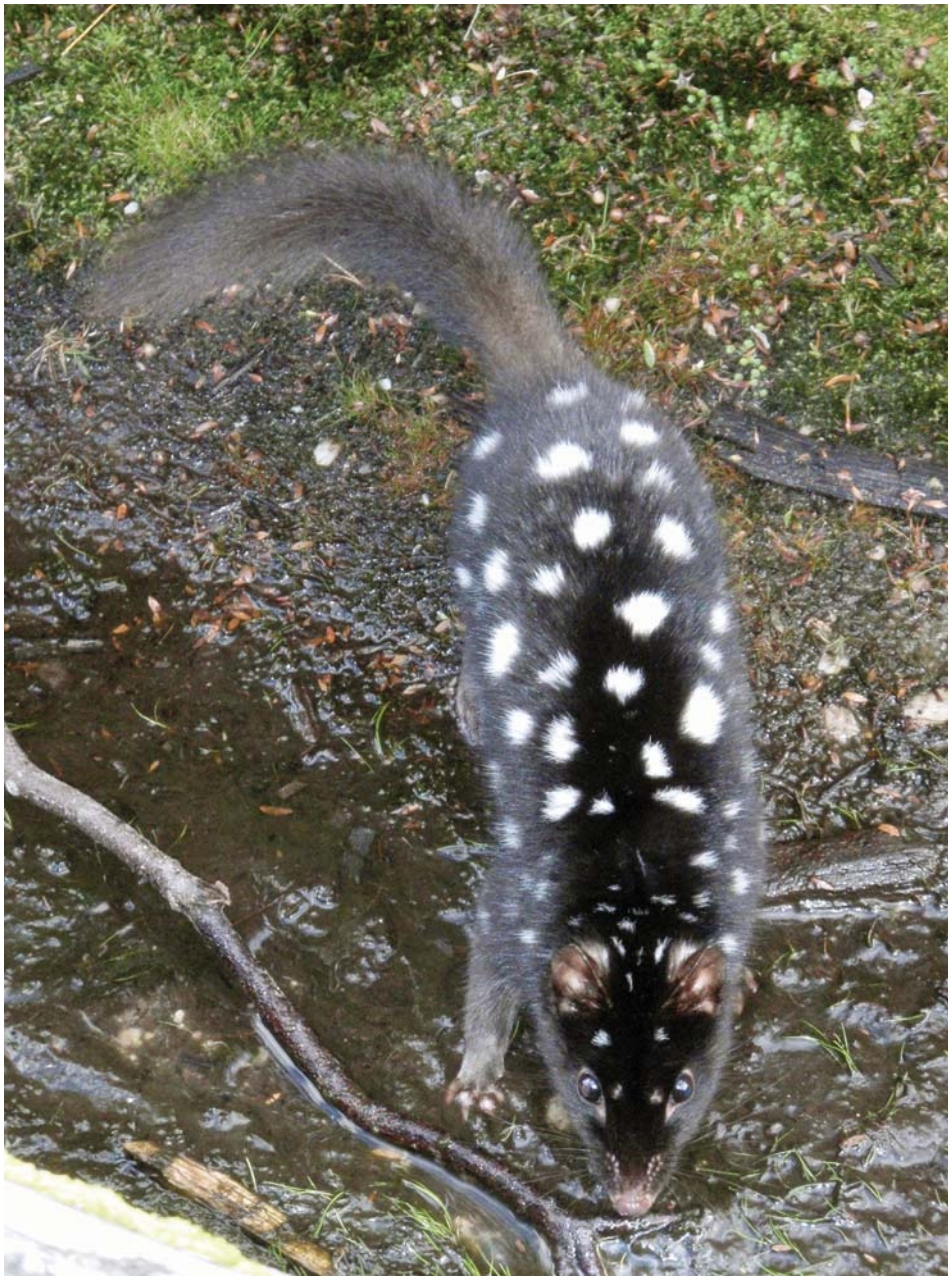


Down but not out:

Spatial and temporal variation in declining eastern quoll (*Dasyurus viverrinus*) populations in Tasmania

Bronwyn Fancourt,
School of Zoology,
University of Tasmania

The eastern quoll is a small carnivorous marsupial that plays an important ecological role in reducing carrion and controlling pasture grubs throughout much of agricultural Tasmania. It is considered extinct on the Australian mainland, with its demise primarily attributed to predation by foxes (*Vulpes vulpes*), although disease has also been implicated. Tasmania now represents the species' last remaining stronghold, but whilst still considered widespread and common throughout Tasmania, the eastern quoll is facing a rapid decline in numbers. Recent spotlighting trends suggest declines of over fifty percent statewide over the past ten years, with some areas showing more marked declines than others. If these spotlighting surveys accurately reflect changes in wild eastern quoll populations, then such a reduction meets the IUCN criteria for listing the species as endangered.



A black eastern quoll at Cradle Mountain

Reasons for the rapid rate of attrition are not currently understood and as such, no appropriate management plan exists for the ongoing monitoring, management and conservation of the species, nor the mitigation of key threats responsible for its decline. In the absence of any definitive cause and with the recent introduction of foxes into Tasmania, the eastern quoll may be facing a very real threat of extinction.

This research is a critical step in filling current knowledge gaps surrounding the current status of the eastern quoll across Tasmania and in identifying responsible agents of decline and associated stressors. The objectives of the project are two-fold:

- To establish relative abundance of the eastern quoll at a number of sites across Tasmania and compare results to historic data in order to confirm whether populations are declining, as suggested by annual spotlighting surveys; and
- To assess wild eastern quolls for any apparent causal factors that may be contributing to their decline (eg body and health condition, reproductive output,

Image above: Bronwyn Fancourt with a Tasmanian devil captured as part of the eastern quoll surveys

dietary analysis, population demographics, etc).

I have collected mark–recapture data through live trapping of eastern quolls at three study sites around Tasmania during March, May and July. Each of these sites was historically considered an eastern quoll 'hotspot', however, my preliminary results from all three sites appear to support the declining trends identified in the spotlighting data.

The next logical question is 'why?' Numerous samples have been collected from captured individuals to help in analysing possible causative factors. Analysis of morphometric data, blood samples, scats and population structure is currently underway to try to identify if health condition, reproductive output, diet or broader ecological factors may be indicative of any potential agents of decline or associated stressors. Whilst the list of potential agents of decline is almost endless, this analysis will help identify which areas warrant more detailed testing and those that should be considered priorities in future research.

A tan eastern quoll on Bruny Island

I would like to thank the Wildlife Preservation Society of Australia for their financial support, which has contributed to the crucial fieldwork component of this research. I would also like to acknowledge the provision of additional financial and in-kind support from: Holsworth Wildlife Research Trust, Royal Zoological Society of NSW, M.A. Ingram Trust, Save the Tasmanian Devil Program and the University of Tasmania.

Eastern quoll pouch young

Australia's freshwater biodiversity:

Decision making for conserving Australia's freshwater biodiversity under climate change and land-use change

Chrystal Mantyka-Pringle,
School of Geography,Planning and Environmental Management Centre for Spatial Environmental Research (CSER), University of Queensland

Much of Queensland's natural environment is climate-sensitive and at risk of a potential decline in biodiversity due to climate change impacts such as increasing temperatures, more severe droughts, riverine flooding, storm tides and sea-level rise. When combined with other threats, such as land clearing, urbanisation and changes in hydrology, there is growing evidence to suggest that climate change will negatively interact with other stressors and synergistically contribute to the degradation of freshwater biological diversity at the species, genetic and habitat level.

The main aim of my project is to gain an understanding of the combined effects of climate change, habitat loss and other drivers of land-use change on freshwater ecosystems. Then, to develop a framework and recommendations for making robust decisions to conserve biodiversity in the face of both climate and land-use change. This research will combine decision analysis with quantitative ecological models to identify priority actions to conserve freshwater biodiversity threatened by climate and land-use change in Queensland. This will address critical questions arising in the development of policy for climate change adaptation, especially in respect to maintaining environmental values and ecosystem function.

My PhD project will make a significant contribution to Queensland's capacity for improved decision making for climate adaptation and enhance our understanding of the combined effects of climate change and land-use change on freshwater ecosystems. In Queensland our ecosystems are some of the most biodiverse areas on the planet. For example, the Wet Tropics represent one of the richest biodiversity hotspots: around 42% of Australia's native freshwater fish species, 58 waterbird, 42 frog and 152 aquatic plant species, and many of these are found nowhere else in the world. A new Decision-Analysis Framework and a Decision Model for freshwater biodiversity conservation in Queensland will be developed and tested. This will lead to improved adaptation options to ensure freshwater biodiversity resilience; and a shared understanding how to incorporate climate change adaptation measures into routine conservation strategies and natural resource management.

Spangled perch (*Leiopotherapon unicolor*)

Crimsonspotted rainbow fish (*Melanotaenia duboulayi*)

South east Queensland freshwater ecosystem

Freshwater turtles, dispersal, and river damming:

Using genetics to investigate likely long-term impacts of river damming on ecologically diverse freshwater turtles

Erica Todd,
School of Marine and Tropical Biology,
James Cook University

Human-induced changes to river systems (eg damming, water extraction for irrigation) severely impact sensitive freshwater organisms through processes such as habitat loss and fragmentation. My PhD research focuses on a neglected but important group, freshwater turtles. Australia supports a distinctive and ecologically diverse turtle fauna. However, these key components of freshwater ecosystems are very poorly researched. In particular, very little is known about the dispersal patterns and population genetics of most species.

Dispersal among small local populations is important for species survival. It connects populations across the landscape, preventing inbreeding and allowing recovery from local extinctions. However, the extent to which impoundments present barriers to dispersal in highly aquatic turtles is largely unknown, making it difficult to assess the likely long-term impacts of reduced dispersal on population connectivity and persistence. Some river turtles may also be more vulnerable than others due to their specific habitat requirements and assumed reduced dispersal capacity.

My research aims to establish the important link between habitat specialisation, dispersal ability and population connectivity, in order to assess likely long-term impacts of river regulation on ecologically different river turtles. Specifically, I'm using genetic techniques to compare patterns of genetic diversity and population connectivity (gene flow) between at least two very different species of turtle. Krefft's turtle (*Emydura macquarii krefftii*) has broad habitat requirements and is common and widespread in Queensland. By contrast, the white-throated snapping turtle (*Elseya albagula*) is a threatened ecological specialist unique to the Fitzroy, Burnett and Mary River drainages of central and south-east Queensland. As the project progresses, I also hope to include other turtle species, such as the little-known Irwin's turtle (*Elseya irwini*) identified from only a few sites within the Burdekin River system of north Queensland.

The most enjoyable part of my research is field work. I have already travelled to many interesting sites throughout Queensland to catch turtles, by boat or snorkel or using nets and traps. Turtles are measured and tagged, and a small sample of skin is taken from each animal to provide DNA for genetic analyses. To date, I have collected genetic samples from over 130 turtles

Common Krefft's river turtles waiting for release back into the Fitzroy River

Image Above: Erica Todd working in the genetic's lab.

from five separate species. Other Australian turtle researchers have kindly supplied many more samples for my project.

This research will be the first detailed comparative genetic study of ecologically important river turtles in Queensland, and the first of its kind to assess long-term genetic implications of dams and weirs for this group. It will have important conservation outcomes, providing invaluable information for species management programs and for prioritising conservation actions. By addressing a prominent research gap in Australian freshwater turtle biology, I hope that a better understanding of the vulnerability of different freshwater turtle species to habitat fragmentation will assist conservation planners to design more effective management strategies.

The beautiful Fitzroy River

A juvenile white-throated snapping turtle

The role of cracking clay soils in maintaining fauna and flora biodiversity in the arid rangelands of South Australia

Helen P Waudby (PhD Student),
School of Natural and Built Environments,
University of South Australia.
Sophie (Topa) Petit (Academic Supervisor)

I am investigating the dynamics of biodiversity in cracking clay soils of the arid rangelands. In particular, I am trying to determine why these soils are important for biodiversity and how their associated wildlife is affected by cattle grazing. Grazing is the dominant industry in the rangelands and it is expected that this research will assist in refining our knowledge of the interactions between stock, the landscape, and wildlife. The main aims of the project are to examine the shelter properties of cracks (especially their role in temperature and humidity control), determine the effects of grazing on flora and fauna biodiversity at several study sites, appraise the role of cracking clay soils in arid-zone food webs, elucidate how cracking clays are used spatially and temporally by small arid-zone fauna, and develop recommendations for the management of areas characterised by cracking clays.

Much of my time is spent at six study sites, located on a cattle lease approximately 180 kilometres south-east of Coober Pedy in arid South Australia. Vertebrate and invertebrate trapping (with pitfall and Elliott traps) began in April 2009. When captured, a number of measurements relating to condition are recorded for vertebrates, while invertebrates are collected for later identification and biomass analyses. I also collect vertebrate scats for dietary analysis and determination of food webs. The temperature and humidity of cracks are examined with data loggers, in summer and winter. Certain vertebrate species are radio tracked in order to understand how they use cracking clay habitats.

Woomera slider (*Lerista elongata*)

Cracking clay soils support a range of mammal and reptile species at my study sites, including plains rats (*Pseudomys australis*), fat-tailed and stripe-faced dunnarts (*Sminthopsis crassicaudata* and *S. macroura*), Forrest's mice (*Leggadina forresti*), Giles' planigales (*Planigale gilesi*), gibber dragons (*Ctenophorous gibba*), Eyrean earless dragons (*Tympanocryptis tetraporophora*), and Woomera sliders (*Lerista elongata*), to name a few. Many of these species choose cracks as shelter when they are released. Preliminary radio tracking data suggest that dunnarts use cracks as resting sites during the day. Interestingly, the cracks provide a relatively stable microclimate, showing minimal fluctuations in temperature and humidity compared to conditions outside of cracks. In summer, these cracks may exhibit temperatures several degrees cooler than those outside, while in winter the cracks are warmer than prevailing outside temperatures. Several field trips are left; I expect that the research will be completed during 2011.

I feel privileged to have been given the opportunity to conduct research in the arid zone. It has rekindled many memories from my childhood spent on a cattle station in central Australia and reintroduced me to the enigmatic and fascinating wildlife of the Australian desert. I am extremely grateful to the Wildlife Preservation Society of Australia for supporting my research, both in 2010 and in 2008.

Image above: Helen Waudby releasing a reptile

Bat succession in restored bauxite minesites of the jarrah forest

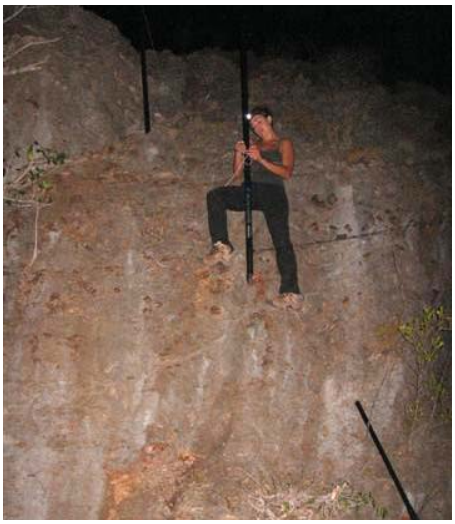
Joanna Burgar,
School of Biological Sciences,
Murdoch University

South-west Australia is one of the world's 25 biodiversity hotspots; this region holds exceptional concentrations of endemic species that are facing extreme losses of habitat. For example, this area is home to two species of bats, western false pipistrelle (*Falsistrellus mckenziei*) and western long-eared bat (*Nyctophilus major*), that are found nowhere else, other than one isolated western long-eared bat population in the Nullabor Plain. The native jarrah forest (*Eucalyptus marginata*), located within the Darling Range east of Perth, is included in this biodiversity hotspot. Alcoa of Australia Limited (hereafter Alcoa) holds a mining lease encompassing almost all of the northern jarrah forest, clearing and mining over 500 hectares annually. Alcoa is committed to restoration with the goal of establishing a self-sustaining jarrah forest. A considerable investment of work has been dedicated to evaluating this restoration goal in terms of vegetation, but much less research has focused on the ability of wildlife to recolonise these restored bauxite minesites.

In total, nine species of forest-dwelling insectivorous bats inhabit the native jarrah forest of south-western Australia. Bats are often considered to be resilient to human disturbances as they are highly mobile, roost in man-made structures and have a diverse diet. However, bauxite mining tests this resilience with the complete clearing of over-mature, senescent trees that house hollows suitable for bat shelter and breeding. Hollow-formation can take over a century to develop and the rate of loss of hollow-bearing trees will undoubtedly exceed replacement within a bauxite mined landscape. A rough calculation derived from studies on bat roost requirements and hollow formation in jarrah and marri (*Corymbia calophylla*) trees suggests that one hectare of average stand structure jarrah forest yields approximately 28 hollows suitable for tree-dwelling bats. As bats preferentially choose hollows, a conservative measure may be a rate of 5,000 to 10,000 roosts lost per year in the northern jarrah forest due to bauxite mining. Of course, trees naturally die and fall in a normally functioning ecosystem but bauxite mining both accelerates and concentrates this loss.

Artificial tree hollows, or bat boxes, are one interim solution. An extension of my PhD research will be to place bat boxes within restored minesites, testing a variety of designs, to determine their potential as a means of ameliorating the impact of bauxite mining on jarrah forest bats. The funding provided from the Wildlife Preservation Society of Australia is instrumental as it has enabled me to purchase 12 bat boxes, which will be placed in the jarrah forest in October and monitored fortnightly over the next three years. The findings from my research will be provided to Alcoa to incorporate into future land management decisions that best conserve bat populations in the northern jarrah forest.

Lesser long-eared bat (*Nyctophilus geoffroyi*)



Joanna working in the field

Planting a resilience movement:

Best-practice approaches for restoring Murray-Darling ecosystems that are resilient to climate change

Martin Breed,
Australian Centre for Evolutionary Biology and Biodiversity,
and the School of Earth and Environmental Science,
The University of Adelaide

Habitat restoration is critical for ameliorating the ecological impacts associated with climate change. Existing restoration practices are generally based on *ad hoc* 'rules-of-thumb', lacking a firm scientific basis and failing to account for future climates. This risks wasting limited resources and producing sub-optimal long-term outcomes. We propose to build on current seed sourcing and restoration techniques, so that revegetation practitioners and community groups can make science-based decisions when planning revegetation projects.

We will focus on large-scale revegetation projects in the Murray-Darling Basin (MDB), using three native, keystone revegetation species, *Eucalyptus socialis, E. gracilis* and *E. incrassata*, as our focal species. We aim to investigate (1) the synergistic effects of plant isolation due to habitat clearing and local adaptation on the genetic 'quality' of seeds, (2) the genetic connectivity of trees and populations of trees across the MDB and (3) the tree mating patterns in both intact and isolated contexts. This information will provide very useful practical knowledge about potential alternative provenancing combinations for revegetation scientists, managers and community groups.

From May to July 2010 over 2,500 seedlings were planted at three sites across the MDB for experimental growth trials. The northern site is Scotia Sanctuary (Australian Wildlife Conservancy), the middle site is Yookamurra Sanctuary (Australian Wildlife Conservancy) and the southern site is Monarto Woodland (Forestry South Australia). Each seedling was measured and had a leaf sample collected for DNA extraction prior to planting. Seedling establishment and performance will be monitored for at least the next two years to assess the genetic 'quality' of seeds. The upcoming spring and summer period will involve genetic work to determine mating patterns and genetic connectivity across the MDB for the target species. Over thirty dedicated volunteers of all ages, backgrounds and interests have helped make this enormous task a success thus far and we hope many more will contribute in the future.

The core of this project is funded by a Native Vegetation Council of South Australia research grant, and the financial support of the WPSA is greatly appreciated – thank you!

Eucalyptus gracilis seedling just after planting at Yookamurra Sanctuary

Eucalyptus incrassata seedlings looking healthy at Mt Lofty Botanic Gardens Nursery

Pollination in action: this large butterfly, a spotted Jezabell (Delias aganippe), was one of many seen sipping the nectar in a stand of flowering Eucalyptus gracilis in July 2010, north-eastern Dengali Conservation Park, SA. Pollination is an important factor in determination of seed genetic 'quality' and pollination is likely affected by climate change and habitat fragmentation. All Photos: M Breed

A snappy bit of research:

Assessing the level of impact of cane toads on Australian freshwater crocodiles

Ruchira Somaweera,
School of Biological Sciences,
University of Sydney

Interactions between predators and prey are the major drivers of the dynamics of populations, communities and ecosystems. When either the prey or the predator becomes an invasive species, it has the potential to alter natural ecosystems by different pathways, such as predation, competition, disease transmission or indirect negative effects on food webs. While much research has been focused on understanding how native prey adapt to exotic predators, the opposite issue – responses of native predators to exotic prey – is less well understood.

The cane toad (*Bufo marinus= Rhinella marina* under the current taxonomy), a large invasive toxic amphibian, has expanded its range through more than one million km² of Australia since its introduction to Queensland in 1935. The defensive toxins of these toads (toxins of the bufadienalides group) are very different to those found in Australian native frogs. Because Australia has no native toads, many Australian predators, including freshwater crocodiles (*Crocodylus johnstoni*), do not have resistance to these naïve toxins, and die from eating the toads. Intriguingly, the population-level impact caused by toads on freshwater crocodiles shows great spatial heterogeneity, ranging from no discernible impact in certain water bodies to massive population reductions in other areas (for example 77 percent population decline in certain water holes at Victoria River after toads arrived).

Currently, we do not know the magnitude of the population declines in crocodiles for most locations, and we do not know how long it will take for populations to recover following toad invasion. Potentially, populations could recover slowly (over many generations) or quickly, by selection for changes in feeding behaviour or toxin resistance. One part of my PhD seeks to examine whether different populations of

Australian freshwater crocodile

crocodiles throughout their range (Queensland, Northern Territory and Western Australia) have different levels of resistance to cane toad toxins. I am measuring the resistance of individual crocodiles to toad toxin by using the decrement in swimming speed following a dose of toxin (the chemical by the trade name Bufalin, which is very similar to toad toxins). In another set of experiments I am assessing the feeding responses of hatchling crocodiles towards toads and native frogs and testing whether crocodiles possess innate learning abilities to avoid certain tastes (thus learn to avoid cane toads). Results from these experiments along with my ongoing field-based studies (toad–crocodile encounter rates, crocodile population structure over time, stomach content analysis etc.) will allow me to determine whether freshwater crocodiles show adaptive changes in response to cane toads, and if so, how long it takes for such changes to occur once an area is colonised by cane toads. This information is crucial for predicting the longer term impact of toads on freshwater crocodiles, identifying which geographic populations are most at risk from toads, and allowing effective management plans to be formulated.

Hatchlings about to be swimming in a heated pool in the laboratory

Sub-adult crocodile grabbing a large female cane toad

Ecoenergetics of the western swamp tortoise:

Modelling the translocation viability of Australia's rarest reptile

Sophie Arnall,
School of Animal Biology,
University of Western Australia

It is now widely accepted that many parts of Australia will undergo relatively rapid changes in climate. In the past, species could move into neighbouring habitats as environmental conditions changed. But now, habitat destruction and fragmentation will prevent many species from dispersing into areas capable of supporting them in the long term. As Australia already has the worst rate of mammal extinction in the world, and has an ongoing history of rapid habitat alteration, it is likely to become a hotspot for species extinctions unless new solutions can be discovered to mitigate the effects of environmental change.

One promising, but controversial, solution to protect vulnerable species is to physically translocate them into climatically suitable areas – a process termed 'assisted migration'. This process has been identified as being a potential management option for Australia's rarest reptile – the western swamp tortoise (*Pseudemydura umbrina*). The western swamp tortoise was thought to be extinct until it was rediscovered in 1953. A single breeding population of less than 100 individuals now occupies an ephemeral swamp on the outskirts of Perth, Western Australia, and three non-breeding populations exist on reserves to the north into which individuals bred in captivity at Perth Zoo are being introduced. Despite intense conservation efforts, population establishment has been hindered because of a shifting climate. In particular, a decreasing trend in winter rainfall has resulted in the swamp habitat becoming increasingly marginal, and constant pumping of bore water has been necessary to maintain water levels at one site since 2003. Current conservation practices have demonstrated that captive-bred tortoises can be successfully introduced into the wild, but translocation sites that can offer good habitat under future climates are urgently required to ensure the long-term survival of the species.

My research aims to address how we can pinpoint the sites where threatened species are most likely to survive under future climates, by modelling the energy balance of the western swamp tortoise under current and future climates. I am collaborating with staff at Perth Zoo and the Department of Environment and Conservation in project SWAMPI – the South West Assisted Migration for endangered Populations Initiative. I will measure the effects of temperature and food availability on the metabolic rates, growth rates, digestive physiology and behaviour of *P. umbrina*. The biophysiological data I collect will be integrated with an independent model of their wetland habitat, and the resulting mechanistic model will be used to predict tortoise survival, growth and reproduction under different climate scenarios. These models will allow me to predict which wetlands will allow tortoises to survive and reproduce under hotter, drier climates. While decision-making frameworks can be constructed to assess the potential biological and socio-economic costs of assisted migrations, high resolution models that are capable of predicting species survival under future climates will be critical in increasing the success of translocation programs in the future.

A western swamp tortoise fitted with a radio-tracking device. Photo courtesy of Gerald Kuchling

A captive-bred tortoise being released by Sophie Arnall

Declining *Eucalyptus wandoo* woodlands:

What habitat characteristics impact wildlife?

Tracey Moore,
Centre of Excellence for Climate Change, Woodland and Forest Health,
School of Veterinary and Biomedical Sciences,
Murdoch University

Since the 1980s, *Eucalyptus wandoo* have been experiencing a decline across their range from their higher rainfall locale in the Perth Hills to the drier woodlands of the wheatbelt. To date a number of studies have been instigated to examine the possible causes of the decline. However, no studies have examined the possible impact of the decline on fauna. Loss of *E. wandoo* trees or even stands can reduce habitat quality and alter habitat characteristics such as leaf litter, understorey density and canopy cover which provide foraging and shelter resources for fauna. On a broad scale this study aims to determine how the changes in habitat characteristics due to declining tree health impact on small mammals, reptiles, amphibians and birds in the *E. wandoo* woodlands. One area of research is how tree decline alters flowering phenology and productivity of *E. wandoo,* and in turn, what impact this will have on the wildlife that rely upon nectar and flowering events for food resources.

Seed traps have been installed underneath 24 *E. wandoo* trees in different states of health to collect fruit, seeds, buds, flowers and opercula. This will allow the determination of flower (therefore, pollen and nectar) resources, and fruit resources available from healthy or declining *E. wandoo* trees. Canopy seed stores of *E. wandoo* are additionally being monitored at monthly intervals.

Bird surveys investigating the direct impacts of *E. wandoo* crown decline on their foraging resources are underway.

Western pygmy possum (*Cercartetus concinnus*)

Western pygmy possum (*Cercartetus concinnus*)

Foraging rates determined by bird observations indicate the differences in foraging resources (including pollen and nectar resources revealed by the seed traps) between healthy and declining *Eucalyptus wandoo* trees.

Future work in 2011 will include radio tracking of *Cercartetus concinnus* (western pygmy possum) to determine the impact of tree decline on their nesting and foraging sites. To date, 25 individuals (from over 16 trap nights) have been captured, with the majority found in healthy sites. In addition to tracking, the flowering phenology data will reveal what pollen and nectar resources are available to *C. concinnus*. Little is known about the biology of these small nectarivores and their mysterious lifestyle. This study hopes to investigate what nesting and foraging resources these tiny animals are using to determine whether the decline of *E. wandoo* tree health is likely to negatively impact their biology.

From this work we will hopefully have a better understanding of the impact of tree decline on woodland wildlife and how it can be better managed.

Floodwaters making their way to Lake Eyre

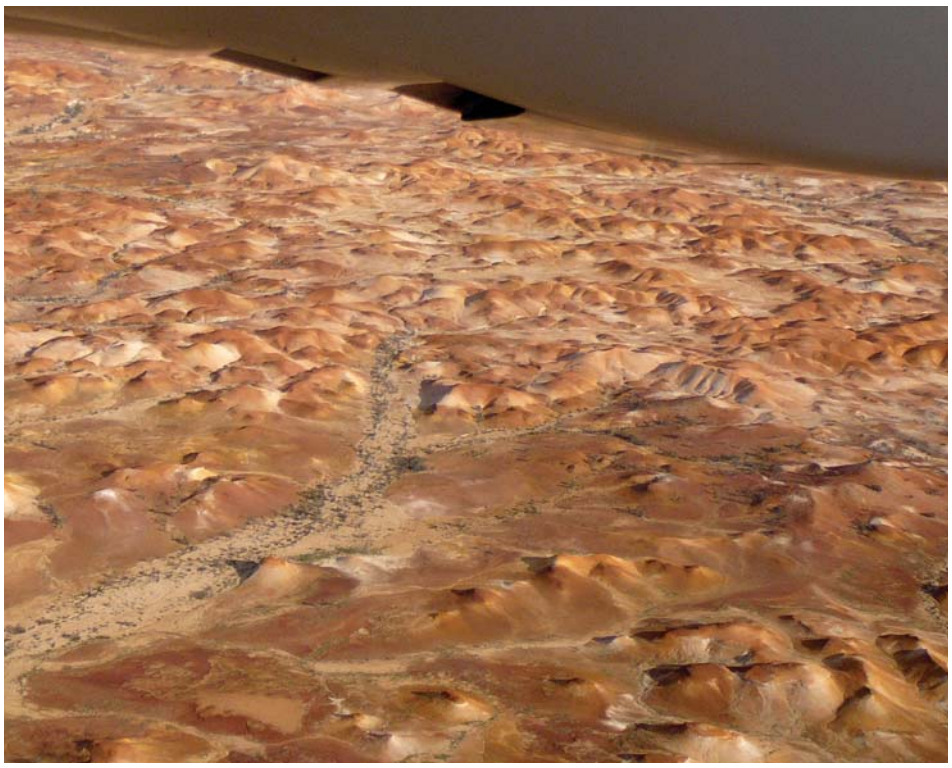
The outback in flood

Dr Clive Williams, Vice President, Wildlife Preservation Society of Australia Limited

Since the massive floods in Queensland earlier this year and the subsequent filling of Lake Eyre, television broadcasts have brought views of this spectacular event into our homes. However, actuality is much better and seeing really is believing.

Recently I was fortunate enough to take a trip by plane, taking in Bourke, Birdsville, a flight over the floodplains, Lake Eyre, Coober Pedy, the Painted Hills, Wilpena Pound and Broken Hill. It was literally a flying visit to these places, but nonetheless memorable.

It was great to stand on the old wharf at Bourke, where once barges were loaded full of wool, to witness the Darling wide and flowing. Large flocks of corellas made their noisy presence felt. Photos in the local hotel reminded us visitors of Bourke in its heyday and of its history, including its association with Henry Lawson. The flight into Birdsville was an eye-opener. It set the scene of what was to come as we looked down on green and not the usual barren landscape. For those who are conservation minded two things stood out in Birdsville. The small town of 120 people has a geo-thermal power plant, using the boiling water from the artesian basin below it to generate its power. The plant has a back-up diesel plant if needed, but a second geo-thermal plant is to be installed this year so that a back-up plant will no longer be needed. The second thing to catch my eye was a large sign on the road leading out of town about the endangered bilby. This sign has been erected by Queensland National Parks and its educational efforts will be of interest to members of our Society as we have devoted much effort ourselves to raise public awareness about this delightful animal.



Aerial view of the Painted Hills

National Parks sign featuring the bilby

The flight over the floodplains was a highlight. Watercourses, large and small, were like living veins and arteries giving life to the body of the earth. A fantastic sight! If only the green growth could remain. What a difference water makes. Even though we flew low we were still too high to observe the birdlife. Coober Pedy is an experience in itself. As most people know, many residents live underground where the temperature remains a constant 23-24 degrees Celsius year-round, when it can be over 40 degrees above ground during summer. Nowadays, there is little room for new underground homes and most new ones are above ground. To visit underground churches, restaurants, jewellery shops and to stay in an underground motel room is a rare experience. What is dramatic is to see fossils of shells in the walls of the Anglican Church. It is a reminder that in the far geological past Coober Pedy was obviously part of the seabed.

Our flight back from Coober Pedy took us over the Painted Hills. I must confess that I had never heard of them, which is not surprising as few people have seen them and they are not accessible by land and can only be seen from the air. These are dramatic twisted hills in which, over millennia, dissolved minerals have oxidized into shades of red, yellow and white. Fortunately they are undisturbed and remain in pristine condition. Our pilot then took us on a low sweep over the Flinders Range and several circuits of Wilpena Pound before a stop at Broken Hill and return to Sydney. After covering over 4,000 kilometres I was aware of both the vastness of our country, its fascinating variety, but also its fragility. It has been coping with the droughts, fires and floods for aeons past. We need to allow it to continue to cope without intrusive interference.

Fossils of shells in walls of the Anglican Church

The plight of the southern hairy-nosed wombat

Linda Dennis, Regional Advisor

Southern hairy-nosed wombat with Sarcoptic mange

The wombats' plight …

As with much of our wonderful wildlife, the southern hairy-nosed wombat is in trouble.

Major threats include roadkill and injury, predator attack, habitat loss and urban development, burrow destruction and the debilitating infestation, Sarcoptic mange.

Mange is a relatively new disease for the southern hairy-nosed wombat. Whereas mange has been present in the bare-nosed wombat species for a long time - and some consider that the bare-nosed wombat has built up *some* immunity to it - mange has only recently found its way into southern hairy-nosed wombat populations and, because of this, it is hitting the species hard, as it has no immunity, and entire local populations are being wiped out as a result.

The biggest threat to the southern hairy-nosed wombat is us. Humans. With urban development, farming practices and financial income placed as a much higher priority, the wombat doesn't stand a chance. The species is officially classified as 'common' however many believe that they are vulnerable, barrelling head first into the same predicament as the northern hairy-nosed wombat.

Although a native animal to Australia and here long before us and our farms, many believe the southern hairy-nosed wombat to be vermin, a pest that is to

At a glance…

Southern hairy-nosed wombat - *Lasiorhinus latifrons* (broad-headed hairy-nose)

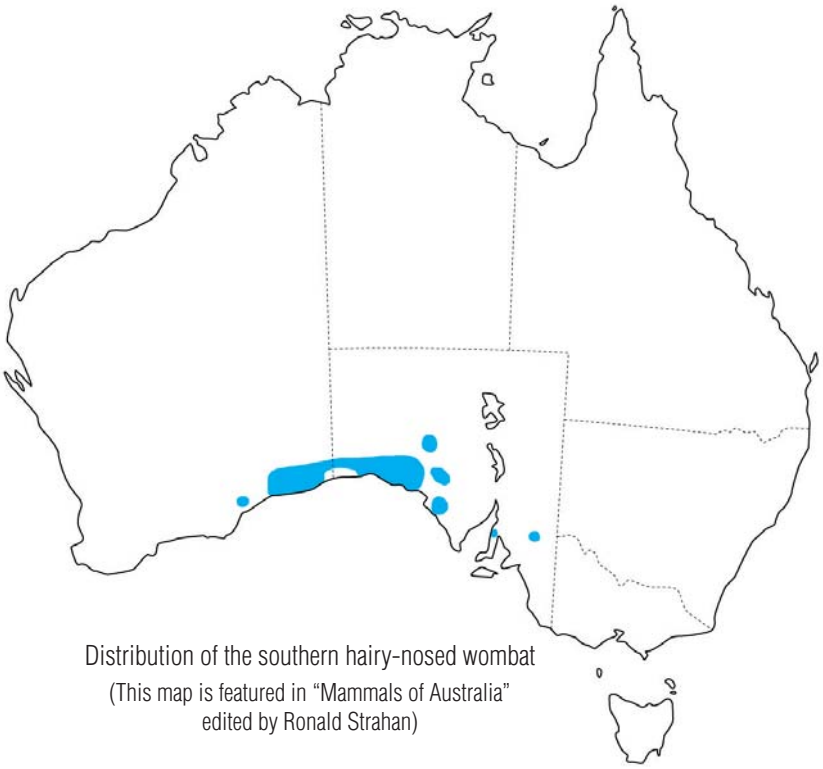
Size - Head and body length: 772 – 934mm
Tail length: 25 – 60mm
Weight: 19 – 38 kg

Identification - Stout head and body with short, powerful limbs. Squarish nose covered with fur. Soft, silky grey-brown fur. Differs from *Lasiohinus krefftii* (northern hairy-nosed wombat) in having nasal bones longer than frontal bones (R. Strahan).

Other names - Hairy-nosed wombat.

Status - Common; limited.

Habitat - Semi-arid land.



Distribution of the southern hairy-nosed wombat
(This map is featured in "Mammals of Australia" edited by Ronald Strahan)

be exterminated. Many farmers have this view because they believe wombats destroy their fences, and because a wombat may have up to twelve burrows in its home range with three to four main burrows which will house a network of subtunnels, including multiple entrances and sleeping quarters, which can also damage fields.

It is on this subject that my article is written – the belief that wombats are vermin, the cruel and unusual practice of burrow bulldozing, and the people who are trying to stop it. The unsung Wombat Warriors.

Wombat Warriors at work …

In June I had the pleasure of visiting Brigitte Stevens and Frank Mikula of the Wombat Awareness Organisation (WAO) in South Australia.

My visit was scheduled for just after the National Wildlife Rehabilitation Conference and for the purpose of checking out Brigitte and Frank's tireless work to save the southern hairy-nosed wombat from decline.

I've been in contact with Brigitte for some time now. She contacted me through Fourth Crossing Wildlife for support and advice and I was only too happy to help out such a worthy cause and such dedicated Wombat Warriors.

As Brigitte's and my relationship grew from wildlife colleagues into a lasting friendship, I learnt more and more about their work and the wombats' plight. And it isn't good news on the latter front.

It was distressing to learn that the southern hairy-nosed wombat is in a great deal of trouble in South Australia. Although it is the state's official fauna emblem, the wombat holds little value in South Australia and government authorities, such as the Department for Environment and Heritage (DEH), seem to be turning a blind eye to the problems that face the wombat.

One problem in particular that I found rather distressing is wombat burrow destruction. Culling – both legal and illegal - have long been present in the species, but unfortunately it is seldom carried out in a humane and legal fashion. As an easy alternative, wombat burrows are ploughed in, completely demolished, and often while wombats are still inside. This would obviously lead to a slow and painful death for the wombat or wombats trapped inside the burrow.

The act of burrow bulldozing is a huge problem in South Australia. There are many farmers who consider the wombat to be a pest – vermin - an animal that only causes damage to crops and fences. It is not seen for the magical and mysterious native species it is.

I've actually lost track of how many times Brigitte has called me in deep distress, to tell me that yet another farmer has bulldozed burrows. What makes it even more terrible is that oftentimes burrows on public land, and land that is well out of any plough or cropping line, are also demolished. Each time WAO reports the incident to DEH, and also to the RSPCA, highlighting the very real possibility

This wombat burrow (on public land) was re-opened by WAO, with the help of original Wildlife Warrior Bob Irwin, after it had been bulldozed by a neighbouring farmer. A wombat was found alive inside!

Another burrow that had also been re-opened (in the background behind this burrow) - where a wombat joey was heard after having been buried alive - has again been completely destroyed by the land owner, maybe re-trapping live wombats inside.

The southern hairy-nosed wombat

that wombats have been buried alive. Most times these incidents are not followed up.

To combat the problem of burrow bulldozing WAO initiated the Wombat Mitigation Project, a program to help farmers co-exist with wombats by developing and implementing viable alternatives to wombat culling.

At WAO's expense, measures are taken to eliminate the need for culling permits that, sadly, seem to be issued by DEH far too often. Granted, wombats can cause damage to farming activity; land erosion, damage to fences and other infrastructure and grazing competition. But there are alternative options to culling and it is these options that WAO provide to farming communities.

There are currently 72 properties participating in the WAO Wombat Mitigation Project. Most of these are located in the Murraylands area and include the localities of Cambrai, Sedan, Sandleton, Eudunda, Kapunda and Dutton. As stated previously, all the work is done free of charge on the participating properties in return for complete wombat protection.

Work carried out by WAO include repairs to fences, revegetation using endemic flora of the region, installation of wombat gates, installation of 'wombat friendly zones', implementation of wombat repellants, rabbit control, educating the community on the importance of the wombat and why wombat destruction isn't an effective choice, and ongoing support. In dire situations when farmers don't agree to any of these alternatives; translocation of wombats.

All this work is carried out primarily by just three people; Brigitte, Frank and their 'wombats-little-helper' Clare Jans. Each day one or more of the team travels the length of the active wombat zone looking out for roadkill, orphaned wombats, wombats affected with Sarcoptic mange and burrow destruction.

During my three days with Brigitte she took me to some of these locations. We seemed to drive forever – along WAO's usual and well beaten track – in search for wombat mishap. One day we found a freshly killed female wombat, another victim of roadkill. Looking at the pouch of the wombat we noticed that she had been a mother with a joey at foot, evidenced by the long teat protruding from the pouch. Brigitte immediately set the area for surveillance, calling in help to monitor the wombat in the hope that the joey could be trapped and rescued.

Day two and I was shown around Portee Station, a 17,000 acre property abundant with wild southern hairy-nosed wombats. As we drove around what I like to call '*Wombat's Paradise*',

Work carried out by Wombat Awareness Organisation includes wombat gates in areas of fenceline where wombat activity is high

Another victim of roadkill - the pouch of this dead mother shows that an at heal joey was orphaned as a result of her death.

Brigitte told me of the hunters who regularly enter the property illegally and either terrorise or kill the resident wombats.

We also saw a wombat suffering from Sarcoptic mange. As I strategically manoeuvred closer and closer to this wombat for the best photo possible, Brigitte urgently called me back as she recognised the signs of the mange, which I was surprised to see, looked quite different from the mange affecting their bare-nosed wombat cousins. If frightened, a southern hairy-nosed wombat will dart into its burrow and stay there for days without re-emerging. As Brigitte immediately made plans to return and install a mange self treatment flap – another of WAO's projects - to the burrow, she didn't want the stupid photographer scaring the wombat into the burrow where it would not be able to be treated for this dreadful and debilitating disease.

WAO, with the help of other like minded conservation organisations, are hoping to purchase Portee Station and create a wombat conservation zone. A place where wombats – and in fact all wildlife – will be protected and conserved forever.

Help save a species …

WAO needs help. Purchasing such a large parcel of land of course costs big money and donations are always welcome.

Donators will not only be helping a worthy cause established by two very dedicated Wildlife Warriors, but will be helping to create a haven for our wonderful wombats to survive and flourish in.

Help isn't just about monetary donations, volunteers are also welcome - your chance to get up close and personal with the wombats. You can learn more about Wombat Awareness Organisation and their work by visiting www.wombatawareness.com

The Wildlife Preservation Society of Australia also works hard to conserve the southern hairy-nosed wombat as well as its cousins, the northern hairy-nosed wombat and the bare-nosed wombat. You can learn more about WPSA's wombat work at our website – www.wpsa.org.au

Wombat conservation …

I guess my main aim with this article is to create awareness for the plight of the southern hairy-nosed wombat. And to challenge government authorities to step up to the game and ensure that the southern hairy-nosed wombat does not end up like its cousin, the northern hairy-nosed wombat, that is high on the critically endangered list. We need to protect and conserve all our wombats NOW, and not wait until they are classified as 'critical' before any work is done to ensure their survival.

How will you help to save the southern hairy-nosed wombat?

A happy, healthy wombat at Portee Station

A fit and healthy Fuddles

Territorial aggression

Linda Dennis, Regional Advisor to Wildlife Preservation Society of Australia

Bare-nosed wombats are known – in most cases – to be particularly aggressive animals and can be highly territorial. Both male and female wombats are known to guard their grazing patches and in times of drought will fight to defend their territory.

Males can also be territorial of 'their women' (females that share, or border on their home range) and do not like new males sniffing around or attempting to mate with females they perceive as 'theirs'. We believe that poor Fuddles, a bare-nosed wombat, has come across such a male since being released.

Fuddles was soft-released on my property several months before Alu and Keti, my two hand-raised female wombats. Before the release of these three wombats there were no wombats living within our property boundaries, although there was a healthy population living in the immediate surrounding area. When the girls were released we think that one of the big males from the neighbouring reserve must have sniffed them out and decided to come and see the attraction!

One morning – when luckily I was at home – Fuddles turned up on the doorstep. It was mid morning, when wombats would normally be tucked up in bed.

It was raining, and Fuddles looked wet, but I decided not to go out as I figured he would just start nipping at my ankles. On a second glace though, I noticed that Fuddles didn't look so great. He waddled up to the sliding door very slowly and plonked onto his bum, head down and eyes closed.

Concerned with his appearance I rushed outside and he barely registered that I was there. I bent down and saw that he was caked in mud from head to toe and the mud was also in his eyes.

He had no energy, was cold and lethargic. I quickly gave him a once-over and was horrified at the state of his rump. Most of the fur on his 'bum plate' had been ripped out, exposing patches of red and weeping flesh.

I washed Fuddles' eyes and face with warm water and noticed he also had a minor injury on his forehead. One of the claws on his left paw was also missing.

I called Todd, who was at work, as I needed help to wash him down, bathe his wounds and assess the damage. Todd was home within 15 minutes of my call and we started the slow process of washing Fuddles down.

After bathing Fuddles with diluted Dettol and warm water we saw the extent of the damage. His skin was red raw over most of his rump and there were many gouges in the flesh. The gouges hadn't broken the skin, thanks to the hard plate that covers the rump area, but they were deep and angry and black.

After Fuddles was cleaned up we made a bed for him in a crate and used the bedding material he had before while in care. We brought him inside into the warmth as we were worried that he wouldn't survive the night if left outside in the cold.

Fuddles slept for 36 hours straight. He did wake once during the night and we thought he was ready to go back outside, however, he found a corner

Fuddles - cold, dirty and lethargic after being attacked

He also had a small injury on his head and one claw was missing

Most of the fur on his rump was ripped out in the attack

to wee and poo in and then slowly waddled back to his bed and fell back into a deep slumber.

Late the next night we awoke to Fuddles screaming the house down! Apparently he had had long enough of being inside, thank you very much! We moved his bed onto the front verandah and this is where he stayed for several weeks before gaining the courage and strength to return to his burrow.

Fuddles visited on and off for a couple of months before he left home again for good. His bum healed very nicely and his fur was starting to grow again.

He gained a couple more kilograms from the good food that 'Mum and Dad' had on offer. But, even with yummy food on tap, his wild instinct told him is was time to leave Mum and Dad again - he's been gone now for several months.

It is so comforting to know that Fuddles knows where safety and help is. I'm sure one day we'll see him again – if he needs us.

Some months after the attack, his rump had healed nicely

WPSA Merchandise

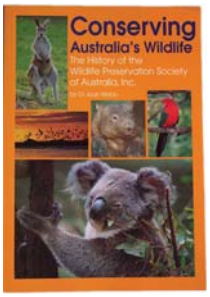
Many of our members have expressed interest in purchasing gift merchandise for friends and family (or even themselves)! This is a great way to support the Wildlife Preservation Society of Australia, so we have responded below with a mail order system. Simply send your cheque or credit card details (with expiry date) and we will post your order out to you. All prices include GST and 20% member's discount. All proceeds go towards our conservation projects.

Polo Shirts - $25
(Navy with white logo / White with navy logo)

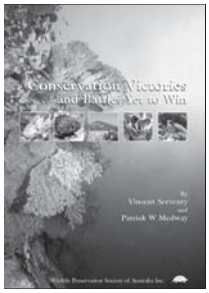
Kids T'Shirts - $10
(Navy with white logo / White with navy logo)

Cap - $10
(Navy with white logo)

Drink Bottle Bag - $10
(Navy with white logo)



Conserving Australia's Wildlife By Dr Joan Webb - $15



Conservation Victories and Battles Yet to Win By Vincent Serventy and Patrick W Medway - $20

Product	Quantity	Size	Cost per item	Total
Polo shirts	_____	M,L	$25	_____
Children's T'shirts	_____	4-6,8,10	$10	_____
Caps	_____	n/a	$10	_____
Drink Bottle Bag	_____	n/a	$10	_____
Conserving Australia	_____	n/a	$15	_____

Add $2.50 per item postage and handling within Australia:
Add $20 per item postage and handling for Overseas orders:
Please allow 14 days for delivery **TOTAL:** _____

Delivery Details

Name: _____

Phone: _____ Email: _____

Address: _____

Payment Details (please tick) ☐ Cheque ☐ Money order ☐ Mastercard ☐ Visa ☐ Bankcard

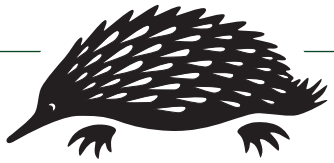
Card Number: |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Name on Card: _____ Expiry: _____

Signature: _____

Send this order by MAIL:
Wildlife Preservation Society of Australia
PO Box 42,
Brighton Le Sands NSW 2216
or for CREDIT CARD payments by fax to:
02 9599 0000
Email: info@wpsa.org.au

Membership Form



WILDLIFE PRESERVATION SOCIETY OF AUSTRALIA LIMITED

PO Box 42 Brighton Le Sands NSW 2216

Membership

Become a member of the Wildlife Preservation Society of Australia Limited
Simply fill out this form.

Name:.....

Address:.....

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

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

Email: .....

Membership category (please tick)

- ☐ Individual: $50
- ☐ Family: $65
- ☐ Concession (pensioner/student/child): $45
- ☐ E-mag (emailed as PDF, no hardcopy will be sent): $25
- ☐ Associate (library, school, conservation groups): $80
- ☐ Corporate: $120
- ☐ Life: $1,000

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

Three year membership (please tick)

- ☐ Individual: $135
- ☐ Family: $175
- ☐ Concession (pensioner/student/child): $120
- ☐ E-mag (emailed as PDF, no hardcopy will be sent): $68
- ☐ Associate (library, school, conservation groups): $215
- ☐ Corporate: $325

(Includes postage within Australia. Add $100 for overseas postage)

Payment details (please tick)

☐ Cheque ☐ Money Order ☐ Mastercard ☐ Visa ☐ Bankcard

Card Number: |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

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

Signature:.....

Amount $.....

Donation $.....

Total $.....

Mail to the: **Wildlife Preservation Society of Australia Limited**
PO Box 42, Brighton Le Sands NSW 2216.
Email: info@wpsa.org.au Website: www.wpsa.org.au

Consider - A Bequest

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

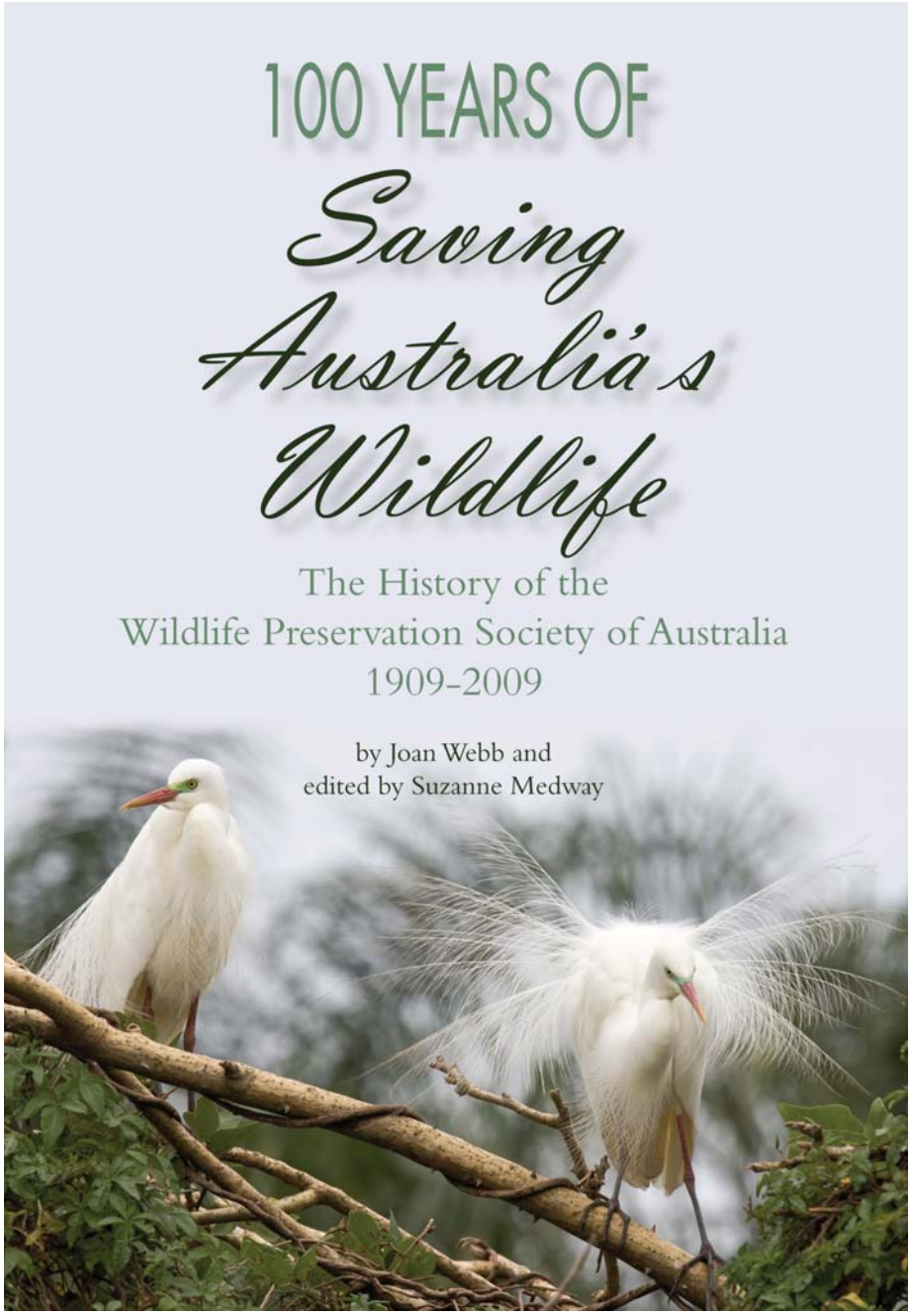
If you would like to make a bequest to the Wildlife Preservation Society of Australia Limited, add the following codicil to your Will:

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

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

SUZANNE L. MEDWAY
President

100 Years of Saving Australia's Wildlife



$29.99 plus $5 postage and handling in Australia

Delivery Details

Name: _____

Phone: _____ Email: _____

Address: _____

Payment Details (please tick) ☐ Cheque ☐ Money order ☐ Mastercard ☐ Visa ☐ Bankcard

Card Number: |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

Name on Card: _____ Expiry: _____

Signature: _____

Send this order by MAIL:
Wildlife Preservation
Society of Australia
PO Box 42,
Brighton Le Sands NSW 2216
or for CREDIT CARD
payments by fax to:
02 9599 0000
Email: info@wpsa.org.au

More photos from tree planting day