AUSTRALIAN Wildlife

SPRING Vol: 4/2009
$10 (non-members)

Celebrating our Centenary

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

Tree Planting Day

National Tree Day was held on Sunday 2 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 thousands of schools, community and green groups, such as ours, as well as hundreds of local councils who facilitated tree-planting projects in their local area.

Wildlife Preservation Society of Australia members and volunteers planted 100 trees donated by Rockdale City Council in the Rockdale Wetlands in Sydney.

Our Society has been participating in National Tree Day and planting trees in this location for the past ten 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.

A delicious BBQ followed the tree planting.

William, Stephen and Olivia Grabowski

Paul Richardson, Oliver Richardson, Olivia Grabowski, Patrick Medway, Stephen Grabowski, William Grabowski, Peter Stock

Back row L to R: Paul Richardson, Patrick Medway, Stephen Grabowski. Front row L to R: Oliver Richardson William Grabowski, Olivia Grabowski

Contents

features

regulars

Front Cover & Back Cover

Waterfall frog *(Litoria nannotis)* which is a northern Queensland species that is listed as endangered.

Photograph taken by Michael Williams / www.itsawildlife.com.au

WILDLIFE PRESERVATION SOCIETY AUSTRALIA

Celebrating our centenary
1909 - 2009

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.

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Price $10 (for non-members)

Membership

Concession: $30
(pensioner, student, child)

Individual Members: $40

Family Members: $50
(being husband, wife and children jointly)

Associate Members: $60
(being schools or incorporated or unincorporated associations with a principal object related to conservation, nature study or education)

Corporate Members: $100
(being incorprated or unincorporated associations not being associate members)

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Our Mission

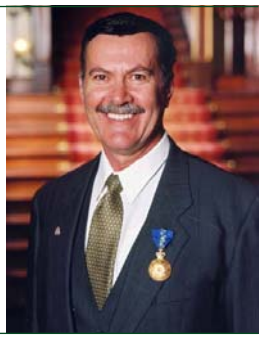
The Wildlife Preservation Society is an independent, voluntary, non-profit conservation organisation, formed in 1909, and is committed to the preservation of Australia's precious flora and fauna. We act as a watchdog and provide advice to government agencies and institutions regarding environmental and 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.

Directors 2009

From the President's Desk

Patrick W Medway AM - National President



Centenary celebrations continue

We are truly delighted with the way the Society's Centenary celebrations have continued on a regular basis throughout the year

Since the outstanding Centenary Luncheon in May when Her Excellency, Marie Bashir AC CVO, unveiled a Centenary Plaque to mark this special occasion in the life of the Society, our Directors have been involved in a number of major civic receptions around Australia.

Director Noel Cislowski and Regional Advisor Ken Metcalfe travelled to Darwin to speak and present at a Darwin City Council Civic Reception in early July. Local members and associated conservation organisations attended and enjoyed the occasion. It was pleasing to note the Lord Mayor is also Chairman of the Cane Toad Reduction Committee for the Northern Territory and has a real commitment to reducing and eradicating this feral pest.

In July, Vice President Dr Clive Williams and Director and Chairman of the Centenary Committee, Noel Cislowski, flew to Brisbane to speak and present at the Brisbane City Council's Lord Mayor's Civic Reception. Some fifty local members and representatives of conservation and environmental organisations gathered in the Brisbane City Hall to enjoy the Lord Mayor of Brisbane's hospitality.

Living Democracy Display in Old Parliament House Canberra

We were delighted to receive an invitation to the official opening of the new Living Democracy Display in the Old Parliament House Canberra. Actor and Chairman of the Organising Committee William McInnis spoke glowingly of the work of the wide list of community organisations involved in Australia's democracy since federation. Our Society was singled out as a fine example of ordinary people exercising their democratic rights to bring about change by influencing and lobbying politicians and government officials to bring in supportive legislation to protect Australia's fauna and flora for the next generation of Australians.

Adelaide Ministerial Reception

On Thursday 3 September 2009 I presented a cheque for $5,000 to the President of the Nature Foundation of South Australia to match a similar cheque being presented by the Hon Jay Weatherill MP, SA Minister for the Conservation and the Environment, in the Balcony Room of the SA Parliament House Adelaide.

These cheques were presented to the President of Nature Foundation for South Australia David Moyle AM for wildlife research into the plight of the Australian sea-lion on Kangaroo Island where, for some mysterious reason, the number of sea-lions have been dropping dramatically in recent years.

On a visit two years ago by members of the Society on their annual Wildlife Study Tour which took them to Kangaroo Island, they observed the plight of the sea-lion pups being abandoned on the beach after the mothers had disappeared at sea. The plaintive call of the abandoned pups left on the beach was almost too much to bear. With a policy of non-interference by the National Parks Service, our members voted to raise and allocate funds for more research into the future of the Australian sea-lion colony.

We wrote to the SA Minister and asked if he would be prepared to match us dollar for dollar to increase the wildlife research fund for Australian sea-lions and he graciously agreed to do so. The Minister then invited us to meet with him for a formal presentation of cheques to the Nature Foundation of South Australia before an invited audience of members, officials and representatives of local South Australian conservation and environmental organisations. Among the guests were members of the executive of the Natural History Society of South Australia, who have done so much to save the southern hairy-nosed wombats at Moorunde Sanctuary.

Mr Glen Taylor OAM, representing the Society's President Dr Peter Clements, spoke on the close association between the Natural History Society of South Australia and the Wildlife Preservation Society of Australia in funding the wildlife conservation work for the wombats in and around the Moorunde Sanctuary area at Blanchetown.

We express our sincere gratitude to the Minister and his staff for their wonderful hospitality and their commitment to wildlife conservation throughout South Australia.

We would also like to thank Qantas for sponsoring the flights to Darwin, Brisbane and Adelaide in our Centenary Year.

L to R: Noel Cislowski, Arian Wallach, Clive Williams – Arian was presented with a cheque for $5,000 at the Brisbane Reception for the Wildlife Preservation Society of Australia's Centenary University Grant

Editorial

Suzanne Medway

I am sure all our members will agree that the pictures of the frogs and toads contributed by Michael and Sharon Williams are amazing

I have really enjoyed putting this edition of *Australian Wildlife* together. It has been exciting reviewing and selecting the range of photographs that contributors have made available. I am sure all our members will agree that the pictures of the frogs and toads contributed by Michael and Sharon Williams are amazing. It was especially hard to select a photograph for the front cover from the many that Michael and Sharon sent to me. My selection for the cover was finally made because I admired the artistic side of this photo. It could be easily hung on the wall as a piece of art.

Another highlight of this magazine for me was receiving the contributions from the winners of the University Grants. The dedication and talent of the twelve recipients is obvious from the articles they have presented. I hope our members enjoy reading about their projects as much as I have.

Long time members may remember Bruce Alden's series of articles beginning in the Autumn 2/2003 edition of *Australian Wildlife* on his time spent as a weather observer with the Department of Meteorology on the Australian Antarctic base of Casey. Well, Bruce is off on a different adventure this time spending three months on a tiny island in northern Queensland. His experience with the bird life on Willis Island makes fascinating reading.

In my role as Executive Director of the Wildlife Preservation Society of Australia I have the opportunity to deal with all types of people and all types of enquiries regarding Australian wildlife. I endeavour to respond to all queries and that is usually the end of the matter, but recently I had the pleasure of receiving a thank you from a young student named Shayal. Here is Shayal's side of an ongoing correspondence. Enjoy!

Hi, my name is Shayal. I am doing some research for my essay, and I have chosen your conservation group. I'm 11yrs old, turning 12 in Dec 5th. I'm in grade seven, and I go to Kallangur State School, which is in Kallangur, Brisbane. Lately, I have been researching a lot and some of the questions aren't on the your website, so if you don't mind I would like to ask a few questions

1. Why was wpsa established?
2. Purpose of organisation?
3. Zoning e.g. local, state, federal?
4. Where are your headquarters?

I would like your response by Thursday thats when I hand in my homework. I would really appreciate it.

Hi, it's me again Shayal.

Sorry, but I forgot to ask you who was the founder of wpsa? because I think it is Mr Harris. Anyway I would like your response.

Thanks for your time

Kind Regards,
Shayal

Hi, it's Shayal again!

I'm not sure, but is the founder of wpsa Patrick W Medway AM, President of WPSA or President of Honour, Dr Vincent Noel Serventy AM.

Thanks for your time,

Cheers,
Shayal

Hi Suzanne,

It's me Shayal, guess what I got a B for my report. I'm actually happy that I got a good mark, thanks to your help. You're a great person to helping people. You're always useful and polite. I am thanking you again, I wouldn't have done this without you.

Thank you,
Shayal

We Need Your Help

The Wildlife Preservation Society of Australia has been dramatically expanding its wildlife conservation and environmental work program and has embarked on an exciting new chapter in its history of wildlife conservation in Australia. One of our primary objectives in our Centenary year is to double our membership base – and we need your help

We are now asking every member of the Wildlife Preservation Society of Australia to encourage one other person to become a member. To help you sign up one new member we have included in this magazine a membership brochure, and detailed below is some of our achievements over the last one hundred years and where we are headed in the next one hundred years.

To move the Society forward and contribute a lasting legacy for the next one hundred years we need to expand our wildlife conservation work and to do this we need new members.

Our Society also needs to enlist the next generation of young Australians to be the successors of the Wildlife Preservation Society of Australia and to build up the Society and help it flourish.

Today, you can feel justly proud of your membership of the Wildlife Preservation Society and what it is doing across Australia through its network of members and volunteers to save Australia's native wildlife in all its many forms. **But we need new members to continue for the next one hundred years.**

What have been some of the Society's historical outstanding achievements?

- Protection of the Australian koala from hunting and shooting since 1909.
- Saved the breeding egret and heron from being shot for its fine breeding feathers for use in ladies' hats and the millinery trade. It is now completely illegal to shoot these birds.
- Initiated legal protection for Australian fauna and flora with the first Acts of Parliament to provide this protection across Australia.
- Encouraged the formation of National Parks and Wildlife agencies in each state.
- Provided extensive funding into wildlife research right across Australia.
- Established University Wildlife Research Grants to assist students to apply good science to the preservation of our native wildlife.
- Lobbied against the use of 1080 poison being used to kill native wildlife in the state forests in Tasmania.
- Supported a wide range of other conservation groups in their important work to preserve and protect our native wildlife.

What is the Society doing now?

- In Western Australia Dr Al Glen, one of the original recipients of our University Grants, is working as a Research Officer with the WA government to save the western quoll, the numbat and other local wildlife.
- In South Australia we recently allocated $5,000, and convinced the South Australian Government to match it dollar-for-dollar, for sea-lion research on Kangaroo Island; we also supported Moorunde Sanctuary and its wombat preservation program.
- In Tasmania we support wildlife rescue groups and rehabilitators treating the terrible facial cancers on the Tasmanian devil and working towards a cure.
- In Victoria we have assisted in the recovery of the eastern barred bandicoot and the regent honeyeater. After the terrible bushfires in Victoria, we referred our donors to support Wildlife Victoria to feed and care for animals injured by bushfires.
- In Queensland we are supporting conservation to save marine sea turtles and the northern hairy nosed wombats; we also joined the coalition that achieved further protection for the Great Barrier Reef Marine Park.
- In the Northern Territory we are working with local groups to reduce the impact of the cane toad on native wildlife right across the north of Australia.
- In Central Australia we are funding research work in the central desert area to preserve the greater bilby.

Representation

Our Society is represented at national conferences and on various committees:

- We have two delegates on the Nature Conservation Council of New South Wales.
- We have a serving board member on the Pest & Animal Control Council.
- We have a serving board member on the Ministerial Advisory Panel on kangaroo management.

We are a member of

- ARAZPA – Australasian Regional Association of Zoos and Aquaria
- Australasian Wildlife Management Society
- Australian Mammal Society
- Royal Zoological Society of New South Wales
- Australian Ecosystems Foundation Inc
- National Parks Association (NSW)
- Australian Wetland Alliance
- River Red Gum Alliance
- Stock Route Coalition
- Australian Network for Plant Conservation.

The future of wildlife preservation

One of the many projects we will be undertaking in the near future is the reduction of roadkill of native animals on highways and roads. We are working to support the reduction of feral animals and plants across Australia which adversely affects native flora and fauna. Three projects we are supporting currently, but would like to increase our contribution to, are the preservation of bilbies, marine turtles and the Tasmanian devil.

We have expanded our support of wildlife carer groups and appointed a Carer Liaison Officer to stay in touch with the wildlife carer groups and thus keep abreast of the major issues they are facing in the rescue and rehabilitation of injured native wildlife.

Let your membership count by signing up one new member to help carry on our work.

Centenary celebrations

South Australian ministerial reception

The Minister for Environment and Conservation, Jay Weatherill MP, hosted a reception in Parliament House Adelaide on Thursday 3 September to celebrate the Centenary of the Wildlife Preservation Society of Australia.

Members, representatives of South Australian conservation organisations and friends enjoyed a sumptuous morning tea in historic Parliament House.

As part of our Society's celebration of one hundred years of wildlife conservation, we made a donation of $5,000 to the Nature Foundation SA which was matched by the South Australian State Government. The funding of $10,000 will contribute to an Australian sea-lion research fund.

Patrick Medway opened the proceedings and welcomed the Hon Jay Weatherill, Member of the South Australian Parliament and Minister for Conservation and the Environment, David Moyle, President of the Nature Foundation of South Australia, Glen Taylor from the Natural History Society of South Australia, Life Members of the Society, members and their guests.

During his welcoming address Patrick said:

In this our Centenary year of the foundation of the Society in 1909 it is our great pleasure to promote the formation and outstanding achievements of the wildlife conservation work of the Society across Australia. For an all volunteer conservation group, we have a proud record of helping to save our precious native wildlife in all its forms. But we can never hope to do this alone and we really appreciate all the assistance we get from a wide range of government and community conservation organisations such as those represented here today. For this wonderful support we are extremely grateful!

It gives me much pleasure to be here in Adelaide today to meet with the Minister and our South Australian members and friends to present a cheque from our wildlife research funds to assist with further research towards saving the Australian sea-lions on Kangaroo Island.

The Hon Jay Weatherill MP, is presented with a Centenary Membership by Patrick Medway

Members of our Society enjoyed a recent visit to Kangaroo Island and witnessed at first hand the plight of the Australia sea-lion living off the eastern coast. We were all saddened to see and learn of the plight of abandoned pups that sit and wait for the parents to return from fishing at sea. The plaintive call of the pups when the parent fails to return 'pulls at our heart strings' when we realise that they will die of starvation on the beach if the mother has been killed at sea - either shot by fishermen who see them as a threat to their fishing industry or taken by hungry sharks between Kangaroo Island and the west coast of Tasmania fishing grounds. We hope that more research will save the day for the sea-lion.

This is just one of the wildlife research programs that we are funding across Australia. We have assisted the Natural History Society of South Australia in the tremendous wildlife conservation work they carry out at Moorunde Sanctuary and the other wombat reserve areas they care for. We are pleased to again congratulate this Society and its members for their outstanding work and commitment to such a good cause as saving the Southern hairy-nosed wombats in this fragile environment near the Murray River.

Minister, we congratulate you also on the work you are doing to save and extend the marine reserve systems around South Australian waters. We know from our research and enquiries that the greater the area under protection, the greater the chance of survival our native marine creatures will have. It is a fallacy to suggest that the local fishing industry will die out. Without reserve systems, all fish and crustacean soon disappear and the fishermen move on to somewhere else. We find they are very short sighted in their approach to the conservation of our natural resources.

Today it is my pleasure to present a cheque for $5,000 from our wildlife research fund to go towards sea-lion research and thank you in advance for agreeing to make a similar contribution to this important wildlife conservation project.

Thank you again for hosting this Reception to mark our Centenary and for your help in protecting and

preserving our native wildlife across South Australia.

The Hon Jay Weatherill MP, Minister for Environment and Conservation responded:

I would like to acknowledge that we are meeting today on the traditional lands of the Kaurna people and that we respect their spiritual relationship with their country. It's great to be here today to help mark the Centenary of the Wildlife Preservation Society of Australia.

As Patrick has just highlighted, the Society has made a huge contribution to conservation in this country since it's formation in 1909. Now, the idea that we must care for our wildlife – value and protect our biodiversity - is widely accepted. But back in 1909, it was not. It was a tribute to the vision and the dedication of the first members of the Society that their work has had such effects on policy and legislation in this country. It was largely due to the work of the Society that legislation was drafted to protect native fauna and flora. This legislation paved the way for the systems we now have in place through the National Parks and Wildlife Act here, and similar Acts interstate.

I feel very strongly that to protect our environment, we need every voice to be heard. And the Wildlife Preservation Society has been an important voice in the debate over our environmental future for the past century.

The late Dr Vincent Serventy, President of Honour of the Society, is widely regarded as the person who established environmental activism as a powerful force in Australia though his campaign to save Lake Pedder.

As time has gone on, and Government has incorporated conservation more firmly into its policy, our goals have converged to a much greater degree. Of course, it is likely that we will disagree on some things – but this is part and parcel of an ongoing debate between Government and organisations such as the Wildlife Preservation Society. And it's this debate that is important. However, the Government does have very significant projects under way that do correspond with your goal to preserve Australia's native flora and fauna.

We have a specific target within South Australia's Strategic Plan to lose no species. The establishment of five landscape scale conservation corridors – and nineteen new marine parks – are an integral part of our work to meet this target.

David Moyle and Patrick Medway

Today I am pleased to announce that the State Government will match the donation by the Wildlife Preservation Society to the Nature Foundation of South Australia's Sea-lion Research Fund.

The Australian sea-lion colony at Seal Bay on Kangaroo Island is one of our State's icons – and an unforgettable tourism experience. But we know that the sea-lion population is declining – and that we need the necessary knowledge and expertise to halt this decline. I trust that our joint donations will assist the Nature Foundation in this important work.

I'd like to thank the Wildlife Preservation Society of Australia – not only for their support of this project, but for one hundred years of dedicated work for our environment.

I wish you every success for your second century.

The Minister and Patrick Medway presented David Moyle, President of the Nature Foundation of SA with two cheques of $5,000 each.

David Moyle responded to the cheque presentation:

On behalf of the Council of the Nature Foundation SA I wish to acknowledge and pass on the Council's grateful thanks for the very welcome $5,000 donation from the Wildlife Preservation Society of Australia to assist our sea-lion research program on Kangaroo Island. Together with the matching $5,000 from the State Government, this will give a significant boost to the research program. Council members asked me to express their gratitude for your assistance and to wish the WPSA well in its next one hundred years!

The long-term decline of seal-lion numbers in southern Australia is a major conservation and economic concern which will only be overcome with long-term scientific research. Continuing funding of such research is the problem, so your generous donation has come at exactly the right moment. It is also very important for Government to be reminded of the importance of this research.

We are most appreciative of WPSA's consideration of our research efforts which always struggle for continuing financial support. Such support underlines the important role that national and state nature conservation organisations play in helping to secure the conservation of Australia's native wildlife.

Our organisation is particularly pleased to help celebrate WPSA's Centenary

David Moyle, The Hon Jay Weatherill MP, Glen Taylor and Patrick Medway

which we think is a remarkable achievement. It reflects the work of past heroes such as Vincent Serventy, who was an inspiration to me in my earlier student days. Vincent inspired me to send a donation to support the work of the WPSA quite a few years ago, but I never expected it would come back with so much interest in 2009!

Once again, thank you to the Wildlife Preservation Society of Australia for its assistance and friendship which is very much appreciated.

Glen Taylor, of the Natural History Society of South Australia then gave a South Australian perspective on the influence of our Society on South Australian wildlife.

To appreciate how our two societies relate I need to give you a brief background of the Natural History Society of South Australia. It was formed in 1960 by a small group of environmentalists to, and I quote from our journal, "promote and raise public awareness of conservation and preservation of indigenous Australian flora and fauna through the maintenance and re-establishment of natural ecosystems and wiser land use".

In its formative years it pursued these aims by lobbying the Government through the presentation of positive proposals on many aspects of conservation in this state.

Then in the severe drought of 1967-68 the Society became aware of Southern hairy-nosed wombats starving in Mallee country near Blanchetown and that the owner of Portee Station was prepared to sell a portion of his pastoral property.

The Society boldly launched a public appeal and, with excellent publicity from the Sunday Mail, raised enough funds to purchase 2,000 hectares. It also increased the Society's membership dramatically.

This was an opportunity for a practical, hands-on project consistent with our aims and it added a new dimension to the way the Society operated.

The reserve was named Moorunde after Edward John Eyre's nearby site on the River Murray when he was Protector of Aborigines.

Fences were erected around the reserve to exclude sheep, the Society set up a roster so that rangers were on duty every weekend and working bees each month dealt with maintenance work.

We mapped all the wombat warrens on the reserve and conducted a comprehensive population study that revealed 200 wombats in the reserve in 1970. Over the ensuing years this has increased to 600.

We conduct ongoing programs for weed eradication and the control of rabbits and foxes, with most welcome financial assistance from the Department of Environment.

But today is all about the Wildlife Preservation Society of Australia.

My wife Margaret and I first met Patrick and Suzanne in 2002 when they visited Adelaide and we were impressed with their intense dedication to the preservation of Australia's wildlife.

Our two Societies have kept in touch for years, by telephone, email and the exchange of our newsletters.

Then, in 2006 part of Portee Station adjoining Moorunde Wildlife Reserve was offered for sale. This was an opportunity that many of us had dreamed of for years.

Having no paid officers, the Society had been able to save some money for just such an event, but the amount of land on offer was far beyond our means. So we appealed to all our members and friends and their response was overwhelming, including a generous donation from the Wildlife Preservation Society.

It enabled the Natural History Society to purchase 5,000 hectares of prime wombat habitat, creating a combined reserve more than three times the original area – almost seventy kilometres square.

Significant, too, in that it connected the State Government's Brookfield Conservation Park in the north with Australian Wildlife Conservancy's Yookamurra in the south and private lands under Heritage Agreements to form a wildlife corridor more than twenty kilometres in length and up to ten kilometres wide.

On 26 March 2008, Dr Peter Clements, Public Officer of our Society attended the Wildlife Preservation Society's Annual Luncheon at Parliament House in Sydney to be presented with the Wildlife Preservation Society's Community Wildlife Conservation Award for 2007.

To receive such an award from a national body, with a history going back one hundred years, is really something very special. We have made a copy of the certificate and proudly display it at the campsite in Moorunde Wildlife Reserve. The cheque was a very welcome addition to our financial position but, more importantly, the award gives an enormous psychological boost to the volunteers who unselfishly devote so much time for the benefit of Australia's wonderful wildlife.

This is just one instance of the countless ways the Wildlife Preservation Society has encouraged the preservation of Australian wildlife over the last one hundred years and, on behalf of our President Peter Clements and all members of the Natural History Society, I congratulate the Wildlife Preservation Society in attaining its Centenary and express the hope that through the inspiration of new generations, it will endure into perpetuity.

Holding on in a modern world

Michael and Sharon Williams

Green-eyed tree frog *(Litoria serrata)*

A personal insight into wildlife photography and the decline of frogs in today's challenging world

Images by Michael and Sharon Williams, IT'S A WILDLIFE - Nature and Wildlife Photography

The fight for survival within the fragments of the modern world will be the ultimate test in 300 million years ...

Wading waist-deep through a fast-flowing stream in the middle of the night, lying down in thick mud in sub-zero temperatures, or maybe climbing twenty metres into a tree is probably not your idea of a fun escape from your day-to-day life ....

Finding and photographing animals in all different kinds of habitat throughout Australia is subject to demands that more often than not take you way out of your comfort zone.

Committing to the task

Driving trucks across Australia since I was twenty years old, I kept thinking, "There must be more to life than this." Now aged thirty-eight, I look back on the last six years and cannot believe I have definitely found it - better late than never!

Something that started as a seemingly simple mission to identify an orange blob of jelly growing on a felled tree in Tasmania has culminated in a commitment to producing high-quality photographic images of Australia's unique flora and fauna. This commitment is to be the catalyst for raising awareness of the need for protection of all habitats and the native species which rely on them for their future survival.

Purchasing a low-end range film camera, my wife Sharon and I would venture out in all conditions to photograph random things we found within the natural world. Not really knowing what subject matter I wanted to photograph, Sharon introduced me to her love of animals through bird-watching and I tried, rather unsuccessfully, to capture images of birds with a cheap 75-300 mm lens. Documenting all camera settings and lighting conditions associated with each shot taken, I referred to this data in order to determine what worked and what did not. All I had to do now was learn about animal behaviour, composition, and where and how to find all these animals, let alone photograph them in a way that I envisioned.

Australian lace-lid *(Nyctimystes dayi)*

Common mist frog *(Litoria rheocola)*

Green-eyed tree frog *(Litoria serrata)*

The next six years of my photographic life would be some of the most demanding of my entire life. Sharon and I would spend hundreds of hours walking around Melbourne zoos and trekking through Victoria's forests. Observing animal body language, I would attempt to learn about individual species traits, ultimately leading to the poses that would make the most attractive shot and allow me to capture the subject's individual personality. I would find out later that this attention to an animal's behaviour would be the key factor in achieving my aim.

Through volunteering with organisations that conduct fauna surveys, a chance meeting with environmental researcher Clive Crouch was to change our lives forever.

Clive has been conducting fauna surveys throughout Victoria for over thirty years and his invaluable experience has pushed our knowledge forward. This has enabled me as a photographer to create the images I thought I would only ever see in my head.

Falling in love

Strong, interweaving currents whip around my lower body trying to destabilise my determination in making my way closer to the squelching, duck-like call coming from a clump of vegetation overhanging the fast-flowing river in which Sharon and I have found ourselves. The call of the male Australian lace-lid *(Nyctimystes dayi)* is advertising the current mating season which will secure the next generation of this endangered species of tropical North Queensland. As well as trying to entice a mate, he is generously exposing his location to a very excited photographer, whose dream it has been for over five years to see this species in the wild. Photographing animals in their natural environment is always to be addressed with a high level of respect for not only the species, but also the habitat you are working in. Such respect will be rewarded by amazing outcomes. My obsession with photographing the more threatened and rare species of Australia can sometimes hamper my ability to capture the shot. When confronted with these species I often forget that I need to take a photo of them, often opting to enjoy the

moment instead. When adrenaline is high, it is too easy to miss the shot and miss the experience, so it is extremely important to try and achieve both, if possible.

With the decline of frog species in Australia happening so swiftly it has left many heads spinning, as researchers try to understand the cause of this trend in order to structure a viable recovery plan. As a photographer and a non-scientist, I find myself quite hopeless and unable to be pro-active in the fight to save an animal I have fallen in love with and that brings me to tears being in its very presence. The bond I have with these unique animals is one that I could never have imagined; I will be grateful for this for the rest of my life. I have now dedicated my life to creating images that capture the beauty and uniqueness of one of the most adaptable life-forms on Earth.

Every action has a reaction

Australia has one of the highest rates of flora and fauna extinction on the planet, but many programs are underway to protect the remaining populations. Achieving this extremely ambitious goal requires the concerted efforts of all humans. Amphibian populations have survived on Earth for more than 300 million years, and of the 6,317 species of amphibians listed worldwide, 5,576 are frogs and toads (http://www.savethefrogs.com/cool-frog-facts/index.html).

In the past two decades, there has been a dramatic decline in frog populations: of the more than 200 frog species in Australia, eighteen are currently listed as endangered and fourteen as critically endangered, whilst many others are in decline due to a number of factors (http://www.frogsaustralia.net.au/conservation/frog-declines.cfm).

After spending their early lives entirely in water, these amazing amphibians make the transition to a more terrestrial life as they possess lungs and breathe oxygen as we do. Frogs also absorb oxygen through their skin, which leaves them vulnerable to pretty much of everything that makes its way into their environment. Human encroachment on amphibian habitats is the key factor in species decline: water and air pollution, deforestation for mining, agriculture, forest industries and housing; spread of diseases including fungal infections

Growling grass frog *(Litoria raniformis)*

Common mist frog *(Litoria rheocola)*

Waterfall frog *(Litoria nannotis)*

Growling grass frog *(Litoria raniformis)*

Waterfall frog *(Litoria nannotis)*

Sharon and Michael Williams

and micro toxins; introduced pests, such as feral cats and trout; and harvesting for the pet trade as well as restaurant menus. All these have taken a massive toll.

Many organisations dedicated to conservation have been forced to undertake breeding programs for species that are on the brink of extinction or for those whose numbers are in great decline. These programs are unfortunately a necessary stand for the longevity of these species. However, the most important aspect of amphibian conservation worldwide, or any wildlife conservation for that matter, is the protection of habitat. An animal without a home is like a house without foundations.

Thanks to the ongoing work of organisations like the Wildlife Preservation Society of Australia and their support of habitat protection programs, the battle to save our flora and fauna species from extinction can be fought more evenly. Without your direct support to organisations such as the Wildlife Preservation Society of Australia, they too will become extinct - just like the very ecosystems they are trying to protect.

Making a difference

The way to help save frog species from extinction is quite easy, and all it takes is the belief that "one person can make a difference", irrespective of your education or standing within our society. The way we each choose to live our day-to-day lives on this planet has an impact on the environment and the other species with which we share it - making yours positive.

Brown boobies

Living in a rookery

Bruce Alden

The view out the window is spectacular. Palm trees sway in the breeze, the coral reef is partially exposed as the tide recedes, the cobalt blue waters stretch to the horizon and birds, birds everywhere. On the lawn, in the scrub and wheeling in the air. Their cries, squawking and fighting and arguing go on all day and all night. I suppose when you are marooned in the middle of a bird rookery, that is what you have to expect.

This is a far cry from when I last wrote for *Australian Wildlife* in 2003, when I was at 67 degrees south. Now, I am stationed for six months with the Commonwealth Bureau of Meteorology on a deserted, barren, tropical island at 18 degrees south, 150 degrees east. The island is 450 metres long, 150 metres wide and nine metres high and we are about 400 kilometres east-north-east of Cairns. The island comes under the jurisdiction of the Great Barrier Reef Marine Park Authority, so we were given a briefing on wildlife and protocols to be observed. Willis Island recently made headlines around Australia when a "Swine Flu" cruise liner was to be diverted here. As it happened, it never made it, being sent back to Sydney.

A bit of history: the island, or rather the islet, was first occupied in 1921. Captain John King Davis of Antarctic fame established a meteorological station at the behest of the Minister of Home and Territories to provide early warnings of tropical cyclones for the Queensland coast. The island has been occupied continuously since then, except when a modern new station was erected between June 2004 and October 2006. During WWII, a RAAF contingent also occupied the island. The station is equipped with a full complement of meteorological equipment, including a dual purpose wind find and weather watch radar, radiosonde and surface observation gear. It is staffed by three weather observers on shift and a Met Tech, whose duties includes keeping everything running - from the meteorology gear, to diesels, desalination, sewerage, to communication equipment. You name it, it is his job and keeps him pretty busy. For more interesting history, try Googling Willis Island. The Bureau of Meteorology web site, www.bom.gov.au has radar and weather information on the island.

My first impression of the island from the *Pacific Conquest* (our resupply vessel), at dawn after a 26-hour voyage from Townsville, was how small it was. The second was the birds. We were anchored about 500 metres offshore and the island was blanketed by wheeling, screeching birds. My

Resting and nesting sooty terns

third impression was the smell ... not too pleasant to be honest but I must say that has worn off after a month, must have become used to it! The trip to shore was by LARC, an amphibious resupply vehicle capable of driving up the beach and onto the island. Upon setting foot on the beach, I was surrounded by seabirds. The low bushes just above the high tide line were covered with nesting and resting red-footed boobies (*Sula sula*) and black noddies (*Anous minutes*). Beneath the bushes, buff-banded rails (*Gallirallus philippensis*) darted about like frightened rabbits. Overhead, sooty terns (*Sterna fuscata*) hovered and wheeled in a bright blue sky. Ah, bird heaven! The noise, it has to be heard to be believed. Penguin rookeries are silent, dead places compared to this. It is all movement. Fighting, arguing, parading, preening, feeding, soaring, diving and swooping. It is all happening at once and the pace never seems to slacken. Life in a bird rookery is a busy place.

The birds seem to have no fear of humans, although different species do seem to be predictable as to when they will fly off when approached. They don't appear to have any predators except for the rails stealing and eating their eggs. The patrolling least frigatebird (*Fregata ariel*) is always hovering overhead ready to steal a meal. He dive-bombs birds returning with a full crop and causes them to disgorge their catch which the frigate promptly catches in midair and devours. Quite a spectacular sight. Seems hardly fair on the poor booby or tern which has had his hard-earned catch stolen and then eaten right in front of him.

It is unavoidable in doing our work that we have to go from A to B near

Courting sooty terns

Red footed booby and chick

or through the birds but we try as much as possible to avoid interfering with them or their nests. We are living right in the middle of one huge rookery. We live with them day and night. When releasing balloons at night, the black noddies are hard to avoid as they seem to be poor at getting airborne. They remind me of floppy toys for some reason as they try to gain flying speed. Their numbers have dropped off since we first got here. We had a change of wind direction and their numbers definitely dropped off after that event. I don't know if it was related, but it occurred at the same time.

The beaches, or rather coral rubble, also have large numbers of brown boobies (*Sula leucogaster*). They are often seen sitting on low rocks and are much more prone to fly off than the red-footed booby when approached. In flight they resemble a goose more than anything. On the beaches we also have red knots (*Calidris canutus*), which are also very flighty. Watching the boobies landing on the few coconut palms or scrub is sometimes quite comical as webbed feet are not ideal for perching. There are many missed approaches causing a go-around and a second attempt. I don't know where they get their pilot wings!

One of the strange bird visitors we get here is a variety of kingfisher. I

Red knot

have been told that they appear on the other tour (the December to June trip), so in all probability I will not get to see them. Exactly why they would appear on this island seems strange to me. There is not a drop of water occurring naturally except if it rains, and there are precious few collection points; the only rock is the reef off the beach. So one wouldn't think that they were coming here for a drink.

Both species of terns and the red-footed boobies are nesting at this time and the chicks are growing fast. One thing I have noticed that is quite different between these sea bird rookeries and the penguin rookeries down south is the apparent high success in the raising of the chicks here at Willis. The penguin rookeries are littered with dead chicks, a virtual carpet of casualties. I imagine the severity of the climate contributes to this. Here, I have seen less than half a

Sooty terns, boobies and station

Common tern and chick

dozen from all the thousands nesting. This is not counting the number of eggs destroyed and eaten by the rails.

We will have shearwaters nesting later in the year and turtles nesting towards December just as we are due to leave, so we may not get to see this happen. Hopefully, a few will decide to nest early.

So, it is time I did some work on this deserted outpost in the Coral Sea. Only five more months before, hopefully, a vessel will appear and take what is left of us visitors back to civilization ... but who is counting?

Buff-banded rail

Resting frigatebird

Brown booby

Logging river red gums is vandalism

Suzanne Medway

After a decade of inaction, the New South Wales Government has recently moved to conduct a rapid regional assessment of the river red gum state forests of south-western New South Wales - a move that should lead to new national parks and a restructured timber industry. The assessment is to be conducted by the Natural Resources Commission and is due to report back to government by the end of November this year.

This follows much controversy earlier this year when the Federal Department of Environment, Water, Heritage and the Arts concluded that the logging was having a significant environmental impact on matters of national environmental significance, and threatened to 'call-in' logging under the *Environment Protection and Biodiversity Conservation Act 1999*.

Above: Barooga State Forest on the Murray River. Photo by Rob Jung

The river red gum wetlands at issue are the largest remnants of vegetation left in one of the most heavily cleared and intensively cultivated landscapes in Australia. They are crucial to the healthy functioning of the Murray and Murrumbidgee rivers, and essential to the survival of numerous threatened and significant plant and animal species in the context of a rapidly warming climate.

For members wishing to take some action on the issue, please log on to the NPA website www.npansw.org.au

The guardians of inland Australia

From the air they are bands of green that emerge from the Great Dividing Range and run along the banks of our major rivers as they snake west. On the ground they are stately silhouettes, mighty arms akimbo, hefty trunks streaked red on white: statuesque, unmoving, some hundreds of years old but with the look of eternity. One cannot help but be filled with the wonder of being in ancient Australia when you look at these old trees and wonder why would anyone want to log them.

Hans Heysen's watercolours portrayed the river red gums as the guardians of inland Australia. He wrote: "The red gums in the creek beds fill me with wonder; their feeling of strength of limb, of vigour and life, suggest the very spirit of endurance."

If we continue to log river red gums, in ten years' time the mature trees will be gone and we will be left with only straggly regrowth. Eighty percent of the landscape along the Murray has already been cleared, and in some areas seventy-five percent of the trees are already dead, dying or stressed because of drought and climate change. It is wanton destruction to log these beautiful, ancient river red gums for firewood, railway sleepers and fence posts.

Patch-clearfelling in Perricoota State Forest, a Ramsar-listed wetland of international significance

The most reliable estimate is that there are only 136 jobs in red gum logging on public lands in New South Wales. Timber jobs account for only 0.2 percent of employment in the region.

On 30 June 2009, logging was stopped forever in 91,000 hectares of red gum wetlands in Victoria. The outcome of jobs lost in the logging industry has been offset by new jobs created – there have been 30 new park rangers appointed in four new parks, 10 jobs in forest management and 24 jobs in the tourism sector.

As Australia's population climbs (to more than 40 million by mid-century, according to the latest estimates) and land clearing becomes more prevalent, we will count every precious hectare of national park this generation has declared.

WPSA lends support

The Wildlife Preservation Society of Australia strongly supports the campaign to save the Riverina red gums. If there is one lesson we have learned from the past one hundred years, it is that conservation battles are only won through ceaseless action against those whose only interest is short-term gain. For example, in the 1920s hundreds of thousands of koalas were killed for the export trade in their skins, without any thought for the sustainability of the species. It took active campaigning by our Society to have this trade stopped. Today few would think of killing a koala for its skin.

Our one hundred-year history tells us that there are always new battles to be fought. One of today's battles is to save the Riverina red gums. In NSW we are faced with the uncomfortable situation where on the southern side of the Murray the red gum is protected from logging, while on the northern side it is not. Red gums on the NSW side of the Murray can be logged and converted into low-value products such as firewood and fence posts and even sold for use in Victoria. Victoria will be protecting its own red gums while burning up those from NSW. It is obscene that such damage to the environment can be allowed to continue. The river itself, the adjacent land and the animal life which depends for its existence on the red gums are all at peril. I urge all members to contact their local member and join us in urging the Premier to take action to create a Riverina National Park to save the whole ecosystem of the area.

Logging leading to loss of hollow-bearing trees, an important habitat resource, in Perricoota State Forest

Mallee fowl

Wildlife extinction in northern Australia

Suzanne Medway

During recent decades, scientists have been recording a vast decline in the original mammal fauna of northern Australia. In the Northern Territory the environment has continued to change and, while many people see the territory as a vast natural landscape, not all is well.

We must begin to understand the subtleness of the ecologies of the wildlife and the diverse ways we have transformed the landscape. Scientists have identified 203 species under threat in northern Australia's vast wilderness. This includes 45 mammals, 17 reptiles, 10 fish, 23 birds and 72 plants.

The great desert skink, hooded robin, brush-tailed mulgara, golden bandicoot and black-footed rock wallaby are on the list. Also included are the following fish: dwarf sawfish, northern river shark, Angalarri grunter and Finke goby. Endangered birds include the mallee fowl, red goshawk, Australian bustard, plains wanderer, partridge pigeon, masked owl and fairy wren.

The emu population has declined by thirty percent in three generations due to excessive fires.

In the past five years, for most species, that decline has become a death spiral. The picture is consistent across the north: in parks, Aboriginal reserves, pastoral country, pristine rangelands and coastal swamps. The pattern has been too plain to miss and many of the likelier causes have been identified, but the rapid disappearance of animals from the landscape seems like something new. It is Australia's most profound ecological crisis that is little known in the nation at large and still quite imperfectly understood. In national parks, where protection regimes are in place, the decline of native species has been devastating.

Causes

Predators, diseases, introduced pests and unchecked burning - is there a single cause or is a subtle combination of stress factors to blame?

Northern Territory's most threatened species include forty-odd small mammals: bilbies, marsupial mice, wallabies, quolls, bettongs and rat-kangaroos.

The last great wave of Australian extinctions was experienced in the Centre, between the 1930s and 1960s, when most of the twenty mammal species known to have been lost from this continent disappeared. That pattern is now repeating further north: animals that were once common are critically endangered. One of the best-known cases is that of the golden-backed tree-rat, an exceptionally graceful creature, which was last seen by European eyes in the Northern Territory in 1969 - a stray sighting in Kakadu's Deaf Adder Gorge.

The black-footed tree rat, a large, spectacular nocturnal forager, was once a common feature of the Top End landscape as far south as Daly Waters and Macarthur River, but its numbers are in steep decline. It is listed as near-threatened and is rarely seen now in its old bush forest habitats.

Scientists know very well from fossil evidence that animals have been dying out in Australia for the past 60,000 years as a result of large-scale climate shifts, and also as a consequence of man's arrival and the use of fire to control the landscape. Today's looming round of extinctions is a strong clue to the strain placed on the tropical and sub-tropical region in recent decades by modern development pressures and by the abandonment of traditional land use techniques.

Mines, ports, dams, cattle stations, all these have changed the workings of the landscape. The remote bush is also being transformed. More subtle, pervasive, insidious long-term shifts are under way. Hence a paradox: it is in the untouched far country that the most startling declines in animal populations are being recorded.

Scientists have only just begun piecing together the role of the dingo in the mammal crisis. The dingo is Australia's top predator and often takes the blame when smaller animals decline. But strong evidence has been found that dingoes in the landscape in fact help protect marsupials. It is when dingoes vanish that smaller, more destructive predators - the fox and the feral cat - rush in and trigger mammal population collapse.

Other factors form part of this complex, interwoven picture. Pastoral properties blanket much of the north. On the face of things, some lightly stocked properties may seem like moderately benign environments for native animals, despite the vast changes to the country caused by cattle. Evidence amassed at Mornington Station in the Kimberley, managed as a reserve by the Australian Wildlife Conservancy (AWC), suggests a different relationship between pastoralism, which introduces new plants, livestock and the original fauna. AWC researchers have found that when parts of Mornington were destocked, fire and predators had less impact on the native mammal population. Cattle were a distinct stress on the ecosystem.

Golden-backed tree-rat

Blackfooted rock wallaby

At the centre of this jigsaw puzzle lies fire, the chief force in the northern landscape. Tropical fires are very different from the dreaded bushfires of the south. Much of the savanna country burns every dry season. Once, the burning season was tightly managed by Aboriginal land users, but the depopulation of the bush during the past century has served to change the vegetation cover and the fuel load. As a result, for decades, wildfires have raged in some parts of the Top End, causing deep shifts in the landscape and mammal populations.

Fire and wildlife preservation

Fire has been a formative influence in many natural ecosystems in Australia. Even before Aboriginal people arrived on the continent, fires were a feature of the landscape, with lightning strikes and volcanic activity providing sources of ignition. Many native plants that are familiar to us today evolved during this time. Chief amongst them are the eucalypts, whose many species dominate our open forest and woodland vegetation. Eucalypts

Australian bustard

are highly flammable, due to the oil content of their leaves, and many are dependent on fire for regeneration. Other fire-adapted species include the wattles, bottlebrushes, tea trees and banksias.

Too little burning can change habitats; too much can be just as damaging, incinerating breeding terrain and opening the country to new predators.

Feral peril

If fire is the constant, regulating presence that shapes the country, exotic species is the new, disturbing element. As is well known, cane toads have swept through the Top End during the past decade. They have done much to wipe out reptiles and some small mammals such as the northern quoll. The toads are only the most recent in a long procession of invaders that have changed the bush: donkeys, pigs, buffaloes, foxes and, most grievous of all, cats have been introduced since European settlement. Cats, perhaps the least seen predators of the north, may be the crucial factor in today's devastation.

The role of feral cats in decimating the Centre's wildlife has long been well understood: the bodies of dead wildcats, almost panther-like in their size, are often encountered in desert rangelands. Their presence in the far north is assumed. They are there, doubtless, deep in the stringy-bark forests and ravine systems, under cover, prowling, but only rarely are they seen or caught. When they are removed from the equation, though, mammal numbers recover fast and, if you can't remove the cats, remove the prey.

Five years ago 64 quolls, gravely endangered victims of the cane toad plague, were rounded up from the Top End. They were moved to two cat-free offshore islands; by last year there were more than 5,000 of them, in greater densities than in their old environment, perhaps a sign that even before the cane toads came, cats had already swept through and begun to kill them off.

Other similar results have done much to highlight the central role played by cats in the collapse of the mammal population.

These, then, are the established factors in the decline of native wildlife. There is an outside chance some other, undetected cause may also be responsible. Introduced pests can bring in diseases; exotic viruses may also be ravaging the mammal population. The shift in the balance of northern Australian nature has been profound and is already irreversible.

Is there an answer?

The scientific answer is that this rapid disruption of nature may have produced an unstable, degraded environment, one that will gradually become more fragile and less productive. The ethical answer is that the native species of Australia have a right to at least a degree of management and protection. The world heritage answer is that northern Australia is one of the planet's last great wildernesses and any further loss of its biodiversity would damage its value.

Recently, intriguing excavation data has been analysed suggesting that several species of Australian mammals have become extinct since European settlement, without modern science being aware of their existence. The destruction, in other words, may well be much deeper than we understand and the remaining wildlife we see around us a more isolated, vulnerable fragment of the original, inter-connected, well-adapted whole.

With the rush to promote resource development in northern Australia, and the power of modern engineering to tame and reshape nature at its peak, the need for cautious government decision-making is at a premium.

Protection for the future

A management program that envisages the systematic transfer of threatened species to island refuges, as well as large-scale monitoring, predator controls and measures to reduce wildfires across the Top End has been suggested. The total cost of this proposal is estimated to be $8 million.

To prevent decimation and extinction of Australia's precious wildlife in the Top End, this would seem a wise initial investment.

Australia's top predator

Predators and prey in the northern jarrah forest

Al Glen, Jennyffer Cruz and Duncan Sutherland - Western Australian Department of Environment & Conservation and Invasive Animals CRC

Situated in the hills south-east of Perth, Western Australia's northern jarrah forest is home to a host of native animals. Some, like the sand goanna and heath monitor, are widespread and abundant. Others, such as the chuditch (or western quoll) are abundant in some areas but curiously absent from others. Meanwhile, the koomal (the Western Australian subspecies of the common brushtail possum), which is usually viewed as a common species, appears to have vanished from many areas of the forest in recent years.

What causes these patterns in the abundance and distribution of animals in the northern jarrah forest? Answers to this question are never simple and usually involve a combination of various factors. A team of scientists from the Department of Environment & Conservation and the Invasive Animals Cooperative Research Centre have been investigating this problem. The team is focusing on two of the most likely causes: the impacts of invasive predators (foxes and feral cats), and differences in the availability of resources such as food and den sites.

Regular seasonal trapping since Spring 2007 has revealed very high population densities of goannas at most sites. At the same time, valuable information has been gathered on the diets, behaviour and seasonal activity patterns of these little-studied animals. Goannas were radio-tracked using transmitters surgically implanted beneath the skin on their flanks.

Chuditch have also been found in large numbers at two sites. However, they are either absent or at very low densities in most other areas. One population, which appeared healthy in late 2007, seems now to have disappeared. Similarly, the koomal persists in low to moderate numbers at some sites, but has apparently vanished from many other areas where it was known to occur ten years ago.

Using information gathered over the past two years, scientists will endeavour to explain these observed patterns. A clear understanding of the factors affecting fauna populations will be vital for their future survival.

A koomal (*Trichosurus vulpecula hypoleucus*) fitted with a spool of red cotton thread for tracking its movements (Photo J Cruz)

Western quoll, or chuditch (*Dasyurus geoffroii*) (Photo J Cruz)

The introduced red fox (*Vulpes vulpes*) (Photo A Glen)

Heath monitor (*Varanus rosenbergi*) with a surgically-implanted radio-tracking transmitter (Photo A Glen)

World's first captive kept beach curlew chicks

Damien Stanioch, Assistant Curator Life Sciences, Territory Wildlife Park

In a world first the Territory Wildlife Park (TWP) in the Northern Territory has collected three curlew chicks from the Darwin region that will become the newest residents at the park.

The three six-week-old beach curlews (*Esacus neglectus*) will be the first of their species to be kept in captivity anywhere in the world at the TWP.

The chicks will become part of an ongoing research and breeding project aimed at learning more about their breeding biology. The breeding program and the display of the birds next year will highlight the plight of species such as the curlew.

TWP's breeding and research program was established three years ago to learn more about the curlews' breeding biology and diet, as well as to learn more about their quirky characteristics.

While beach curlews are common in the Northern Territory, they have become endangered on the east coast of Australia due to habitat loss, human disturbance and predation.

Photo by Damien Stanioch

These large and charismatic birds have several quirky characteristics and their quantity in the Top End provides us with an opportunity to study their particular lifestyle and responses to predators.

Beach curlews lay their one and only egg directly on the sand in a small depression, just above the high tide mark, and have to contend with a great deal of environmental pressures.

They must not only fend off birds of prey, egg-stealing monitors and other predators, but must lay their egg between the king tides to ensure an incubation period of thirty days. Because curlews have never been kept or bred in captivity, TWP zookeepers have a lot to learn about keeping these animals.

We know that curlews are very particular about their habitat and will only live and nest in areas with the right balance of mangroves, sand and rocks to assist the survival of the chick. The chicks will soon live in a purpose-designed enclosure that has the perfect balance of mangroves, sand dunes and rocks to provide them with a habitat to thrive in at the park. Once born, the chicks rely on this habitat for camouflage and protection. The chicks either lie flat or wedge themselves amongst the rocks until the threat has passed. While the chicks hide, the parents call or wail from a separate location to attract the threat away from the hiding place of their offspring.

Curlew chicks in the wild remain with their parents for twelve to eighteen months, so the young chicks at TWP are still being hand-fed mealworms, prawns, mussels and other seafood by keepers every two to three hours.

Photo by Damien Stanioch

Kinglake National Park after the February bushfire

Kinglake

Betty Lynch OAM

Saturday 7 February 2009 dramatically changed the life of many communities as wildfire raged through Kinglake and surrounding semi-rural districts.

The once beautiful, peaceful and proud Kinglake National Park was stark, leaving only silhouettes of blackened trees.

William Hugh Everard represented the constituents of the electorate of Evelyn for 33 years in the Legislative Assembly of Victoria. He was a conservationist - passionate about trees and the entire Australian landscape. In 1928, he envisaged a large parkland, a natural Australian forest and its flora and fauna. It would be a place for education and research, where families could enjoy and appreciate the Australian bush and contemplate the beauty and inter-connectiveness of nature. He was the force behind the initial procurement of 5,590 hectares of land. It is now 21,600 hectares.

Mt Everard, the highest mountain in the park, was named after my father as a mark of respect and admiration by the people of Evelyn and the Government of Victoria. In 2004, with the approval of Parks Victoria, I, with the professional expertise of graphic artist Sue Allnutt, created a memorial to him on top of the mount. It is now irretrievable.

The topography of the park was interesting and diverse, messmate (*Eucalyptus obliqua*) dominating throughout. The southern areas supported a wet sclerophyll forest of tall elegant mountain ash (*E. regnans*) and mountain grey gum (*E. cypellocarpa*) which contributed to protecting an understorey of blackwood (*Acacia melanoxylon*), hazel pomaderris (*Pomaderris aspera*), ferns and wildflowers. The dry sclerophyll areas (including Mt Everard) supported broad-leaved peppermint (*E. dives*), red stringybark (*E. macrorhyncha*) and long-leaved box (*E. goniocalyx*), which protected an understorey of heath, wattles, tussock grass, orchids and bush peas, including the endangered swamp bush-pea (*Pultenaea weindorferi*).

The enormous updraft of oxygen generated by the fire itself created a vortex of flames hurtling skywards and, combined with the oil of the eucalypts, obliterated all vegetation: crowns, surfaces and humus. Will these trees survive and what of the picturesque understorey?

Four months after the fire, my friend Rosalie Freeman and I drove to Kinglake. I had alternating feelings of hope and fear in my heart. We were unprepared for the sight of vast areas of blackened, once beautiful countryside, but greatly admired the courage and resilience of so many people determined to return to their land in spite of losing their house, belongings, stock, pasture and fencing. Australians are culturally undemonstrative and when we passed such properties proudly flying Australian flags we knew that beautiful Kinglake and its community would rebound.

Parks Victoria Ion Maher, Ranger-in-charge of the Kinglake National Park, met us in the Kinglake Village for our four-wheel drive to the park.

Mt Everard was unrecognisable: no bush whisperings, bird songs, gossipings, wildlife or flying insects.

I could hear and feel the silence.

The panels of the unique Everard memorial were flung metres into the bush. Having recovered from the shock, I noticed the *Xanthorrhoea australis* with the promise of flowers in October, a colony of ants busily foraging, then a young wallaby hopped by: an assurance that life in the park would return.

In July Ion Maher reported new fronds on the tree ferns and temporary epicormic shoots generating on the larger eucalypts allowing the trees to survive before their regrowth is established. Many immature and small eucalypts and understorey plants that experienced intense heat and flames have not survived, though seeds and nuts have fallen into the ash bed waiting for gentle rain, which has already fallen. Heavy rain would wash away the ash, taking with it the potential for regrowth. Our early settlers noted that the original understorey is not always replicated, so its future will be interesting to observe. The grasses, too, are shooting and soon there will be a carpet of green, but we must wait until spring or summer for the heath, orchids and wildflowers.

Trees, "the givers of life", are accepted as disposable commodities by peoples throughout the world. William Everard recognised their beauty and value as:

- protective habitats for birds, animals, plants, butterflies, frogs and insects which control pests
- atmospheric coolants contributing to increased rainfall by expelling water vapour
- suppressors of salinity
- food sources for bees, which pollinate food crops and pastures and produce honey
- soil stabilisers preventing wind and water erosion
- converters of carbon dioxide to oxygen
- recyclers of nutrients beneficial for the soil
- protectors of water catchments
- sources of natural regeneration.

What has become of the birds and animals of the park? - wallabies, kangaroos, wombats, koalas, echidnas, possums, gliders, hopping mice, bandicoots, the superb lyrebird (*Menura superba*), owls, eagles, lizards, snakes, insects, frogs, ants (including *Papyrius nitidus*) and the butterflies, including the small ant-blue butterfly (*Acrodipsas myrmecophila*). Most of them perished. It may be years before they return but wallabies have been observed grazing on the young grass and small white fungi which "popped up" immediately after the fire. Recently a parks ranger happened upon several lyrebirds strutting around the Jehosophat Gully. He was amazed and delighted at how they survived. There is hope for all the other creatures.

The annual lyrebird count has just been conducted (July 2009) assessed by sight and songs and, although reduced in numbers, they were present in the usual areas of the park.

To the west of Mt Everard is the Broad Gully–Black Calf catchment area of the park. At the lower altitude the land levels off to a broad gully corridor of sandy soil low in nutrients. Here the shrubby swamp bush-pea thrived under a canopy of brown stringybark (*E. baxteri*) and silver-leaf stringybark (*E. cephalocarpa*). Part of the lower plant can be bare but the upper area is heavily branched and it is here that the crowded clusters of yellow flowers with orange-red centres are borne in October and November. The Kinglake swamp bush-pea is a distinct variant with soft hairs on the calyx and leaves and a tuft of hairs on the summit of the ovary and leaves.

The swamp bush-pea is endemic to Victoria but grows only in woodlands to the north of Melbourne. Classified as rare, there are no signs of it declining as variants may occur unnoticed on road verges and farmlands. This "'fire dependent" plant has not survived the wildfire but has dropped numbers

Swamp bush-pea

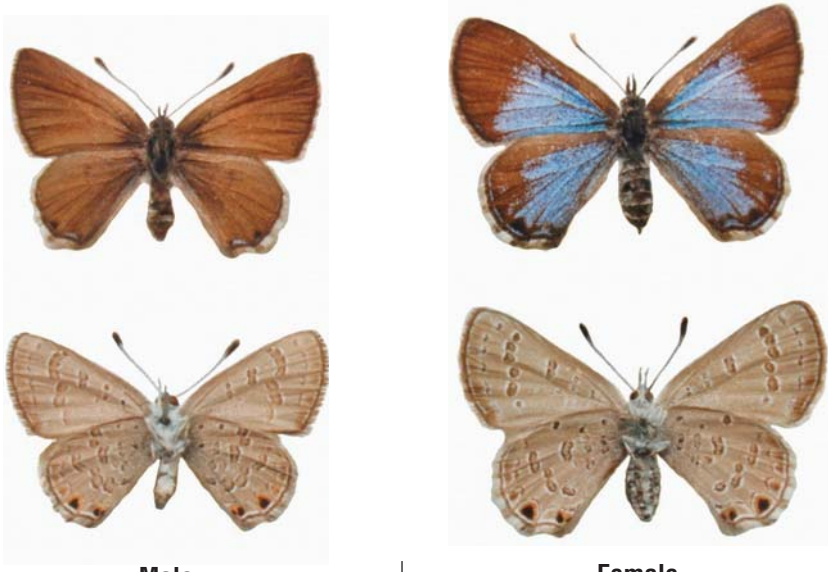
of seeds. Consequently, the area will be protected by Parks Victoria and germination carefully monitored. When trees are threatened, as they were on Black Saturday, they immediately drop seeds or gumnuts, but many factors determine soil seed uptake.

On warm summer days the Mount Everard ridge used to be a busy site for crowds of butterflies. The elusive and beautiful small ant-blue butterfly (*Acrodipsas myrmecophila*) is extremely rare and endangered in Victoria and has been positively sighted on the ridge by Beardsell in 2000, though the incidence remains unsubstantiated. The coconut ant (*Papyrius nitidus*) is essential for the survival of these butterflies (Waterhouse and Lyell, 1914). These small, black ants are distinctive because when disturbed they emit a pungent coconut odour – hence their common name.

Research has been undertaken by a number of scientists, namely: Beardsell, Braby, Britton, Crosby, Douglas, Lyell, McCubbin, New, Quick, and Waterhouse. They have shown that the number of sites occupied by the ant-blue has dramatically decreased over the years; probably Mt Piper in Victoria (where most research has been conducted) is the only one remaining. New (personal communication, 2009) suggests that the small ant-blue butterfly might now be extinct at Kinglake; more research is essential. The reasons for this decline are numerous: dependence on the coconut ant, urbanisation, climatic changes, land management techniques, wildfire, removal of fallen timber (in which the ant nests) and destruction of the forest

William Hugh Everard

Small ant-blue butterfly (*Acrodipsas myrmecophila*)



Male

Hind wing: two obscure, brown-black sub-tornal spots outwardly edged by a narrow, broken, pale-blue tornal line

Female

Broadly mauve-blue Fore wing: broad mauve-blue central area reaching base and dorsum

Hind wing: broadly mauve-blue with two obscure, brown-black subtornal spots outwardly edged by a narrow, blue terminal line.

canopy, acacias and flowering plants. Interestingly, in the Kinglake National Park, Beardsell (June 2009) has observed coconut ants busily foraging. Has the butterfly survived?

The wingspan of the male butterfly is 18 mm, that of the female 20 mm; both are bronzy-brown in colour. Differentiation of the sexes is ascertained by the upper side.

The underside is similar for both sexes: broadly grey-brown with a series of darker bands and spots edged with brown, black and white. Two black subtornal spots on the hind wing are inwardly edged with orange and outwardly edged by a narrow, white terminal line.

On still summer days the male ant-blue butterfly establishes his territory on a treetop along the ridge and awaits a passing female - "hilltopping" - this adult flight period extending from early December to January (New et al., 1995) or it may extend from November to mid-March (Douglas and Braby, 1992). Soon after mating, the female oviposits close to the ground on tree stumps or dead branches and close to the ants' nest entrance. It has been suggested that the ants may build over the newly laid eggs. Hatchling larvae are carried into the ants' nest. When an ants' nest was opened by scientists two immature larvae were disturbed; each was immediately seized by an ant and carried off into their chamber. McCubbin has recorded eggs laid in November hatched four weeks later. A mutual dependence and benefit exists from nutrients exuded by both species of larvae.

The mature small ant-blue butterfly emerges from the ants' nest totally undisturbed:

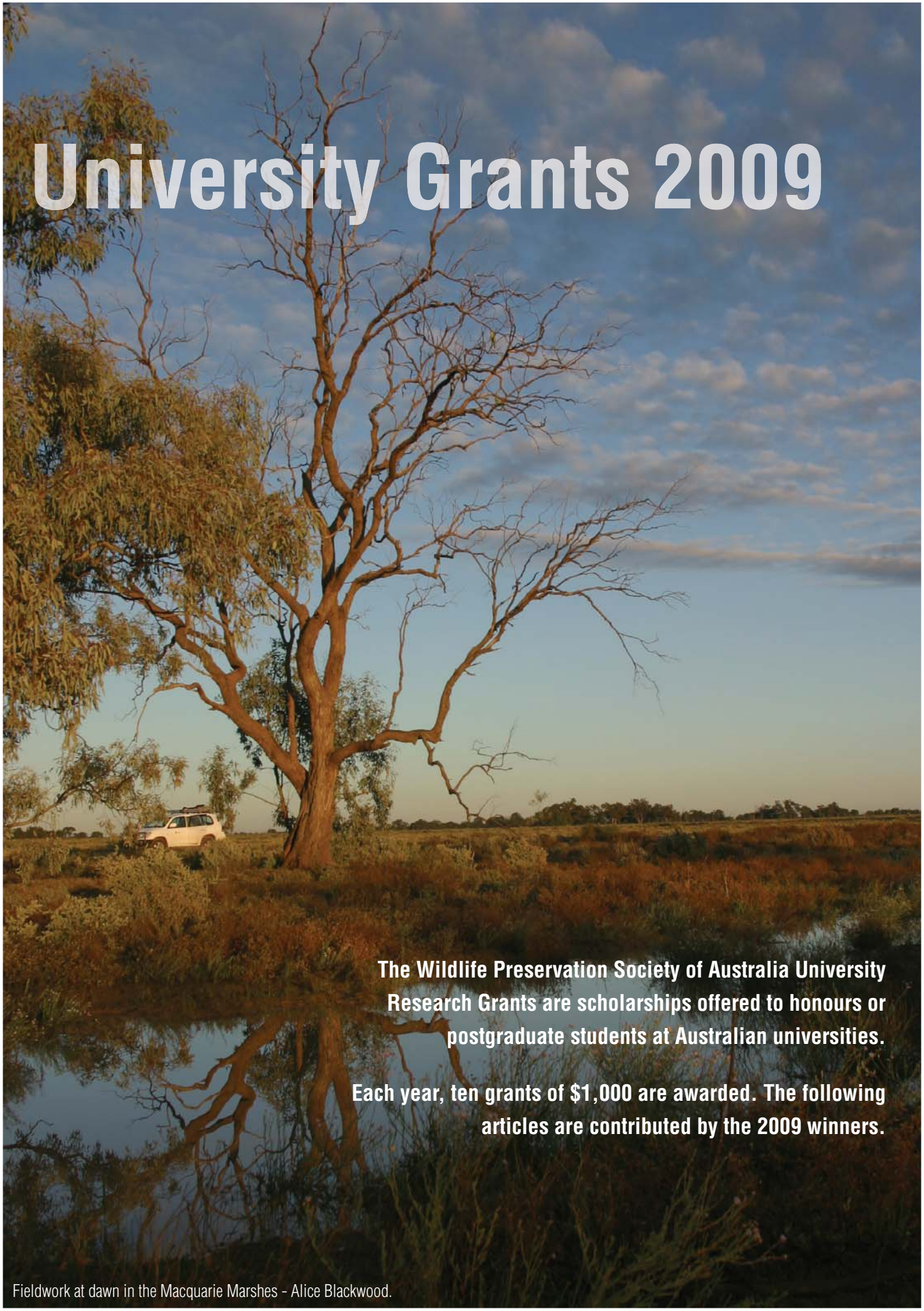
she fluttered slowly above the canopy to the tallest eucalypt
she was approached by a male
they flew together
they settled
the female opened her wings wide towards the sun
they proceeded to mate
the female closed her wings

... and so the life cycle continues.

The fire should make us all stop and reflect on the fragility of life on this, our planet. Every day damaging changes are occurring to the habitats of plants, birds, animals and marine life, much of which are caused by humans.

To all the people of Kinglake and surrounding districts who have suffered as a consequence of Black Saturday: my friends and I mourn with you. We pray you will heal and be given the courage and strength to rebuild your lives.

University Grants 2009



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 2009 winners.

Fieldwork at dawn in the Macquarie Marshes - Alice Blackwood.

Birds, trees and water:

Investigating the effects of river red gum decline on woodland birds in the Macquarie Marshes

Alice Blackwood,
School of Biological, Earth and Environmental Science,
University of New South Wales

My honours project is based in the Macquarie Marshes, a Ramsar-listed floodplain wetland in central western NSW. Like so many other wetlands and river ecosystems around Australia and the world, they have been dramatically changed by river regulation, with the diversion of water for irrigation of crops, such as cotton. Since the construction of Burrendong Dam in 1967, floods have been dramatically less frequent, smaller, and of shorter duration. The largest northern area of river red gums *(Eucalyptus camaldulensis)* is situated in the Macquarie Marshes.

Gentle giant

These trees provide habitat for a diverse community (over 110 species) of woodland birds. River red gums are dependent upon flooding for their water requirements, as rainfall alone is not sufficient. Dramatic changes to the flooding regime have led to the decline and death of large areas of river red gums. My project aims to investigate how woodland birds are being affected by this degradation of their habitat.

I am visiting sites with river red gums in various states of health, all within the Macquarie Marshes Northern Nature Reserve. At these sites I (and my intrepid volunteers) have been conducting morning bird surveys, using the standard 'twenty minute, two hectare' area search. In order to investigate microhabitat selection and behaviour, for every bird I see, I also record where it is in the vegetation (eg on the ground, in the foliage of a live tree, or on a branch of a dead tree) and what it is doing. I am also doing vegetation surveys to assess tree health and associated changes in the understorey.

I have already completed one round of surveying, in autumn and, at the time of writing, I am about to head out for some spring surveys (and hopefully I will detect some evidence of breeding). So far we have seen over ninety bird species. Preliminary results show that the species composition of the bird community is changing as tree health declines. At this stage there are no significant differences in total abundance of birds, or the number of species. This means that the areas of trees in intermediate and poor health are suitable habitat for some species that may not typically inhabit river red gum woodlands. For example, Jacky Winters (*Microeca fascinans*)

Dead red gums

and rufous songlarks (*Cincloramphus mathewsi*) are more abundant in poor sites, while small foliage-gleaning insectivores, such as spotted and striated pardalotes (*Pardalotus punctatus* and *Pardalotus striatus*) and crested shrike-tits (*Falcunculus frontatus*), are more abundant in good sites. Interestingly, fairy-wrens are most abundant in sites of intermediate health. These sites have a dense, shrubby understorey, which is typically suppressed by leaf litter in sites in good health. These vegetation changes are strongly linked to the flood history of the sites.

This study will provide new information on the effects of river regulation upon higher vertebrates. Birds are dependent upon a range of complex features in their habitat, such as sufficient invertebrates for food and adequate sites for successful breeding. Hence by focusing upon woodland birds, information is also gained about the health of organisms lower in the food chain. The degradation of riparian systems has often been measured through the loss of flood-dependent organisms. This project will take a wider perspective by examining the effect of wetland loss on woodland birds, a subject on which virtually nothing is known. I hope that the knowledge gained will contribute to our understanding of the complex ecology of the Macquarie Marshes, and help to inform management decisions.

As well as the Wildlife Preservation Society of Australia, I would also like to acknowledge the National Parks and Wildlife Service, the Australian Geographic Society and Birds Australia for their generous contributions to the project, and my energetic and generous volunteers for their cheerful help.

The volunteer team

Healthy red gums

This is what it's supposed to look like

Beyond the remnant:

The influence of local and landscape level factors on forest-dwelling bats

Lisa Cawthen,
PhD Candidate, School of Zoology,
University of Tasmania and CRC for Forestry, Tasmania

Insectivorous bats may play an important role in ecological balance and forest health as natural controllers of night-flying insects. In Australia, insectivorous bats are under threat from habitat loss through forest clearance for agriculture, urbanisation, timber production and plantation development, which alters habitat availability and removes roost sites. Tasmania is home to eight known species of bat, all insectivorous and considered tree hollow dependent. Given their reliance on tree hollows for roost and breeding sites, it is thought that if large tracts of mature forest are cleared or converted to regrowth or plantation some of these bat species are very likely to decline. This is because tree hollows are considered a limited resource in many environments because they can take over 120 years to develop. Like most other states, Tasmania has management guidelines for the retention of forest habitat, including hollow-bearing trees in timber production areas. Forest remnants are also intermittently left behind in plantation and agricultural areas. Yet we know very little about the effectiveness of forest retention measures at providing suitable habitat for wildlife.

My project is going to use bat call surveys and trapping to determine how insectivorous bats use different types of forest remnants retained in Tasmania's timber production and agricultural areas (ie isolated trees, small patches of trees, streamside reserves) and determine how the availability of mature forest in the surrounding landscape affects bat remnant use, species composition and demographics. As the characteristics of Tasmanian bat calls are still not clear, I will also work on developing a state-wide Tasmanian bat call identification key. I hope that the results of this study will contribute to more informed management actions for the retention of forest habitat, a greater understanding of the distribution, ecology and conservation status of Tasmanian bats and promote future work on bats in Tasmania.

My team of advisors include Stewart Nicol, Sarah Munks, Hamish McCallum and Brad Law. Thanks to the Wildlife Preservation Society of Australia student grant I will be able to travel throughout the state collecting reference calls for the Tasmanian bat call identification key which will be used to help analyse the results of my main questions and help future studies and monitoring programs in Tasmania. I would also like to recognise the following organisations for their financial and in-kind support: the CRC for Forestry, University of Tasmania, Holsworth Wildlife Research Trust, Tasmanian Forest Practices Authority, Forestry Tasmania, M.A. Ingram Trust and the Ecological Society of Australia.

I begin field work in October 2009. As one of the few 'batty' people in Tasmania, I've already had the pleasure of releasing a little forest bat back into the wild (see image below) who had found his way to Sydney in a suitcase. If you're in Tasmania and would like to volunteer for an evening or night trapping bats, please visit the project's website at http://tassiebatproject.jimdo.com

Above: Lisa Cawthen trapping brushtail possums during her previous work investigating the use of retained hollow-bearing trees in logged areas

A little forest bat (*Vespadelus vulturnis*)

A large forest bat (*Vespadelus darlingtoni)*

South West WA:

Exploring the declines of native species in Australia's biodiversity hotspot using the koomal *(Trichosurus vulpecula hypoleucus)* as a model species

Jennyffer Cruz,
University of Queensland, Department of Environment and Conservation and
Invasive Animals Cooperative Research Centre

The south-west of Western Australia is the country's only globally-recognised biodiversity hotspot, renowned for its high species diversity and endemism. Recently, declines have been reported for various fauna species across large areas of the south-west, making conservation efforts in this area of top priority. One of the species to have declined in this area is the koomal, which is one of the smaller (1–2.5 kg) subspecies of the common brushtail possum (*Trichosurus vulpecula).* The koomal`s biggest range is the jarrah forest in the south-west of Western Australia, where populations are stable in the south but have declined in the north. In this study I will focus on whether resource availability and predation from introduced foxes (*Vulpes vulpes*) and feral cats (*Felis catus*) have contributed to the declines of koomal populations observed in the northern jarrah forest. Specifically I aim to:

A koomal fitted with a spool-and-line tracking device

1. determine the effects of resource availability on koomal populations in the Northern Jarrah Forest. The koomal is a browser which possibly supplements its low-quality foliage diet with energy-rich foods such as fruits, seeds and invertebrates. In this study I will focus on the demographic effects of invertebrate abundance, tree foliage and ground plant availability on koomal abundance

2. determine the demographic effects of foxes and feral cats on koomal populations. Fox and cat predation has been linked to the decline and extinction of various native species in Australia, particularly those that fall within the Critical Weight Range of 35g to 5.5kg. However, their effects on koomal populations have received little attention.

Factors affecting koomal populations potentially limit other mammal species inhabiting similar areas as well. Therefore, results from this study are likely to improve conservation efforts not only for the koomal, but also for other mammal species present in the northern jarrah forest. Findings from this study will therefore provide vital insights into which factors limit native mammal populations in this global biodiversity hotspot.

Why do plants become invasive?

The role of phylogeny, herbivores and time

Kerinne Harvey,
Department of Biological Sciences,
Macquarie University and the Australian Museum

Invasive plants have become a problem of global proportions, both environmentally and economically. They displace native species, contribute to land degradation and can change the natural balance of ecological communities. Increasingly, it is important to understand what characteristics make a species invasive. Much research has been directed towards identifying traits associated with the success of invasive plant species but, despite a broad body of literature, few consistent generalisations about invasive potential have yet been made. This PhD project seeks to examine the role of herbivory and invertebrate assemblages on native and invasive congeners across invasive species distribution in order to:

- assist in predictions of likely invasiveness
- investigate the changes that occur to invasive species after establishment that may facilitate their integration and spread.

S. madagascariensis (fireweed)

Results from part 1 of my PhD indicated that thirty-seven percent of variation in leaf damage on invasive plants could be explained by phylogenetic distance to the nearest native Australian plant relative. This result indicates that the phylogenetic relatedness of invasive plants to species in native Australian communities may be a useful tool for assessing the invasive potential of non-indigenous plants with respect to colonisation by the herbivore and pathogen community. To follow on from these results, I am conducting further investigations of the role of phylogenetic relationships and insect herbivore interactions in invasion biology. In this study I further aim to:

1. assess insect assemblages and herbivory on invasive, non-invasive and native congeneric species across their distribution, in order to investigate whether phylogenetic relatedness and herbivory are important in the success of the invasive exotic herb *Senecio madagascariensis*
2. understand how quickly exotic plants are colonised by native herbivores over time.

Through a case study on the invasive exotic *Senecio madagascariensis* I am seeking to determine if herbivore assemblages increase in diversity and density over time. The main objective of this investigation is to evaluate the relative importance of the time in which insect assemblages adapt to and colonise invasive plants from its point of entry to its subsequent spread. Invasive plants are among the most pressing issues in applied ecology in Australia. This research aims to assist in providing a predictive power in weed risk assessments, especially in the areas of quarantine and biological control.

Rearing insects from container

S. madagascariesis (fireweed) Gloucester

Nematodes versus toads:

Investigating the potential for parasites to lessen the impact of the cane toad invasion

Crystal Kelehear,
School of Biological Sciences,
University of Sydney and The Invasive Animals CRC

Invasive species are a major cause for global concern; many authorities rank them as the second greatest threat to global biodiversity, behind habitat destruction. Cane toads have spread to cover more than a million square kilometres of the Australian landscape, and have been implicated in the near-extinction of several native predators – notably, northern quolls, varanid lizards and several snakes. Despite widespread public enthusiasm for toad control, their spread is continuing at an ever-increasing rate. We urgently need new, effective options for toad control as their spread relentlessly continues into previously toad-free habitats and they interact with a whole new suite of native predators vulnerable to their toxin.

Considering the high fecundity (females can lay up to 40,000 eggs in a single clutch) and resilience of toads, it is unrealistic to hope to completely eradicate them. Instead we can focus our efforts on lessening their impact as they spread. Toads exert their negative impacts primarily through poisoning their predators. Toad toxicity is relative to their body size – it is possible for some predators to eat small toads (that do not contain enough poison to deliver a fatal dose), survive the experience and learn not to eat toads again. Unfortunately, toads of the invading front-line are predominantly larger than those from long-established populations. This is a primary reason why predator death is so widespread in areas where toads are new to the area – they are big enough to kill an animal as large as a freshwater crocodile, and sufficiently abundant for predator encounter rates to be high. An effective method for reducing the impact of toads on native predators encountering them for the first time would involve reducing toad density and toad body size to reduce encounter rates and give the predators a chance to learn to avoid eating toads.

My previous research has revealed an agent that reduces locomotor performance, body size and survival in young cane toads: it is a lung parasite (*Rhabdias pseudosphaerocephala*) specific to cane toads that was introduced to Australia at the same time as its toad host. Since this parasite is already in Australia, and extensive surveys have failed to find it in native frogs, we can be cautiously confident that this parasite is toad-specific. Interestingly, this lung parasite is very common (up to ninety percent prevalence) in long-established toad populations in Queensland, but absent in the foremost invading toads, typically lagging behind the toad invasion front by 2-5 years. A possible explanation for this phenomenon is that the parasite is having deleterious effects on wild toads, therefore, only the unafflicted toads are fit enough to move across the landscape fast enough to remain at the forefront of the toad invasion. In fitting with this hypothesis, the first parasites to catch up with their toad hosts should be the least virulent parasites since parasites with severe effects on their hosts are likely to either kill their host or slow their locomotion significantly, and therefore, these parasites would be left behind in their compromised host. In support of this hypothesis, preliminary laboratory results suggest that *R. pseudosphaerocephala* closest to the forefront of the host range advance are less likely to establish an infection and subsequently induce pathogenesis in their toad hosts compared to the *R. pseudosphaerocephala* of long-established host populations. Thus, there is the potential for virulence to vary amongst parasite populations within Australia.

I aim to compare parasite virulence amongst *R. pseudosphaerocephala* populations and use these results to maximise the pathogenicity of this parasite in the field.

Amplexing toads

Further reading:

Phillips, B. L., **Kelehear, C.**, Pizzatto, L., Brown, G. P., Barton, D. & Shine, R. (2009). Parasites and pathogens lag behind their host during periods of host range-advance. *Ecology: in Press*

Kelehear, C., Webb, J. K. & Shine, R. (2009). *Rhabdias pseudosphaerocephala* infection in *Bufo marinus*: Lung nematodes reduce viability of metamorph cane toads. *Parasitology* **136**, 919-92

Australian water dragon:

Nest-site selection and embryonic development in the Australian water dragon (*Physignathus lesueurii*): a wide ranging lizard exhibiting temperature dependent sex determination

Nadav Pezaro,
School of Biological Sciences,
University of Sydney

Global climate patterns are expected to change dramatically in the coming decades, and understanding how climate change will impact local biodiversity is a crucial task for modern ecologists and environmental scientists. While major climate changes have occurred in the past, the startling rate of current changes and the major decline in both quantity and quality of natural habitats have severely handicapped the potential of species to adapt, and placed biodiversity at an unprecedented risk of extinction. To persist despite climate change, populations must maintain their ability to reproduce under the novel conditions, which for egg laying species includes the successful (external) development of their eggs. Unlike most birds, which brood their eggs, the majority of reptiles abandon their clutch soon after laying. In such species, successful reproduction depends to a large degree on the mother's ability to choose appropriate nest sites and the embryo's physiological tolerance matching the nest conditions. Thus, retaining the ability to reproduce in spite of climate change hinges on (1) the mother's ability to locate and select nest sites that provide appropriate conditions, and (2) the rate at which the physiological tolerance of the embryo can evolve. The two adaptations are not mutually exclusive, however. An increase in one would reduce the need for the other, and understanding how such a dynamic operates in nature will elucidate the parameters (biotic and abiotic) that facilitate their adaptation and aid in the management and conservation programs for such species.

As common as water dragons are, most people are unaware that, like sea turtles, the sex of water dragons is determined by the incubation temperatures during embryonic development, a process called temperature-dependent sex determination (TSD). Recent models suggest that the sex ratio of species with TSD will become skewed with climate change and ultimately lead to extinction through the overproduction of a single sex. Can mothers adjust their behaviour and compensate for the changing climate by maintain adequate incubation environments for their offspring? Can embryonic physiology evolve quickly enough to accommodate the changes that may occur despite the maternal effort? The impact of climate change on reptile biodiversity will ultimately be determined by these factors and any attempt to model the risk of extinction and expected future distributions must incorporate these evolutionary perspectives if they are to serve a functional purpose in developing effective conservation and management programs.

In this project I am studying the behavioural and physiological aspects of nest site selection and embryological development in the Australian water dragon (*Physignathus lesueurii*). I am testing if and how females adjust their nest site selection in response to variation in climatic conditions, how such behaviour affects incubation temperatures across the geographic distribution of the species, and if the populations of embryos across this range differ in their physiological response to temperature.

Novel approaches to improving the success of reintroductions:

Protecting prey with chemical camouflage

Catherine Price,
Evolution and Ecology Research Centre,
School of Biological, Earth and Environmental Sciences, University of NSW

Reintroducing endangered fauna back into their historical range is a popular approach to species recovery and ecosystem restoration. But in Australia and many other parts of the world, feral predators such as foxes and black rats thwart reintroduction attempts. Reintroduced animals are killed extremely quickly or disappear with their fate unknown.

Unfortunately, foxes and other feral predators occur across most of Australia and limit options for reintroducing threatened species to large predator-proof enclosures or predator-free offshore islands. But if we are to restore our fauna impoverished ecosystems, we need new methods for enhancing the survival of species in areas where feral predators cannot be completely eradicated.

Most of the world's devastating feral predators tend to rely on their sense of smell when searching for prey, for example the red fox (*Vulpes vulpes*), black rat (*Rattus rattus*), stoat (*Mustela erminea*) and American mink (*Mustela vison*). Newly reintroduced animals tend not to move around much in the first few days or weeks after release, and are thus easily found by these olfactory predators. The scent marks, faeces and odours of the newly released animals are likely to accumulate and stand out to a predator from the usual mix of background odours.

I am interested in finding out whether we can exploit the foraging behaviour of predators to reduce the vulnerability of reintroduced animals. My research examines the way in which predators search for and find their prey, and applies the principles of camouflage to olfaction. Visually camouflaged animals match the background on which they are found, making it difficult for a predator to see them. While we cannot make an animal smell like the ground on which it is found, we can do the reverse and make the ground smell like the animal. We refer to this concept as chemical camouflage and it involves distributing scent from prey animals over large areas of a release site. The reintroduced animals are then less conspicuous to predators against a background containing many patches which smell like them.

Bush stone curlew an endangered ground-nesting bird which will hopefully benefit from my research (Photo by Vivian Howard)

Specifically, the funding from WPSA will allow me to examine whether predators transfer an experience of an unprofitable odour from one location to another. An unprofitable experience costs the predator time and some effort but provides no food reward. Understanding whether predators lose interest in unprofitable prey odours at different locations also increases our understanding of some of the behavioural mechanisms that affect the success of predator control programs which use olfactory lures or baits.

Hopefully, we will be assessing the return visits of foxes to sand patches containing an attractive prey lure to assess whether the learnt experience at one location affects visits at other locations. Foxes have proven difficult to work with but we hope to be able to provide an insight into the way in which scent cues are used by this cunning predator, so that we can improve the success of both endangered species reintroductions and feral predator control programs.

Rotational habitat burning:

The effects of rotational prescribed habitat burning on the long-nosed potoroo *(Potorous tridactylus)*

Robert Reed,
Department of Zoology,
The University of Melbourne

Fire is routinely used as a tool by government land management authorities in many parts of Australia to maintain a complexity of age and structure in native vegetation. The term 'prescribed burning' describes the deliberate use of fire, under specific fuel and weather conditions, to achieve defined management objectives. However, the way in which individual animal species respond to these current human-created fire regimes is largely unknown.

The potoroids are a group of small marsupials belonging to the kangaroo and wallaby group. They feed extensively on fungi (mycophagous) and commonly occur in fire-prone environments. Species in this group have suffered major declines in abundance and distribution since European settlement of Australia. Potoroids are recognised as ecologically important, being part of the complex ecological relationship between underground (hypogeal) fungi and ectomycorrhizal trees (such as eucalypts). The loss of mycophagous mammals, such as potoroos, from this system is likely to reduce ecosystem health in the long-term. Thus, preservation of the remaining populations of such species has broad importance for conservation and maintenance of biodiversity.

Long-nosed potoroos (*Potorous tridactylus*) are a rare, but locally abundant species, occurring in eastern Australia. They prefer habitats with dense ground cover vegetation, which provides shelter and protection from predators. It is not clear how current management burns that involve regular, low-intensity fires are altering the habitat use, persistence and general ecology of this species. Thus the major aims of my study are to collect ecological data on the immediate, short-term and long-term effects of fire on the habitat use and population persistence of long-nosed potoroos. The majority of my fieldwork is being conducted in the French Island National Park (75 kilometres south-east of Melbourne) where a robust population of these potoroos persists because this island is fox-free.

The results from my project will be of enormous practical value to wildlife management authorities and will aid in the development of more suitable burning regimes to cater for management of this and other similar species in south-eastern Australia.

I am extremely grateful to the Wildlife Preservation Society of Australia for supporting my project.

A potoroo emerging after processing

Potoroo pouch-young

Rob opening a potoroo trap

Conservation in urban and peri-urban landscapes:

Planning and management of habitat for threatened woodland birds

Karen Stagoll,
The Fenner School of Environment and Society,
The Australian National University

Over half of the world's human population lives in urban centres, and this figure is expected to rise rapidly over the next 25 years. This increasing urbanisation exacerbates nearly every other environmental problem and causes both direct and incidental ecological stresses. As a consequence, many ecological processes are affected, and the richness and diversity of species in urban and peri-urban areas are changing. These issues pose great challenges for conservation.

Birds have been significantly affected by urbanisation. Within Australia, birds that depend on woodland habitats are of particular conservation concern, due to the increasing loss and fragmentation of woodland areas. Effective management of woodland birds in urban areas could be improved by greater knowledge of what vegetation and landscape features provide key habitat resources for these species.

Previous studies have shown that the capacity of urban areas to support biodiversity can vary. This indicates that it is possible to design urban landscapes better to incorporate the conservation of woodland birds. To do this, it is very important to have a good understanding of what vegetation and landscape features are valuable within a given area before development occurs. This is because mistakes made at the onset of development can leave a long legacy, and can be difficult or impossible to reverse.

Double-barred finch *(Taeniopygia bichenovii)*

In my PhD project, I will be taking advantage of a rare opportunity to study bird–habitat relationships in a landscape before urbanisation occurs. The Molonglo Valley in Canberra, ACT, will be the next area of major suburban development in the capital, and thus provides an ideal setting to gain valuable insights to inform conservation planning.

My project will investigate patterns of landscape use by woodland birds in Canberra's urban and peri-urban landscapes. My overarching goal is to understand these patterns and to use this knowledge to inform how urban planning may be improved for the conservation of woodland birds. I have three broad aims for my project:

1. Understand bird–habitat relationships in urban and peri-urban landscapes ("where are the birds and why?")
2. Understand bird–habitat relationships at the boundaries between urban and peri-urban landscapes ("what happens at the edge?")
3. Use this information to guide the design of suburbs to achieve conservation outcomes for woodland birds ("what makes a suburb good for birds?").

Hopefully, urban policy makers, planners and developers will be able to use my findings to better integrate the conservation of woodland birds into their urban planning.

Malleefowl (*Leipoa ocellata*):

How do we conserve a species … cost-effectively?

All photo's courtesy of Joe Benshemesh, Victorian Malleefowl Recovery Group.

Jessica Walsh,
Spatial Ecology Lab,
University of Queensland

Malleefowl (*Leipoa ocellata*) are ground-dwelling birds from the Megapodiidae family. One of their distinguishing features is that they incubate their eggs in large mounds built of sand and leaf litter. They live in southern Australia in semi-arid mallee environments, although most populations are in decline. Malleefowl are classed as vulnerable, endangered or extinct in different states of Australia and are threatened by many factors including fox predation, high grazing pressure from native and feral herbivores and frequent wildfires. This unique Australian bird is a well-recognised icon of mallee country, generating great public enthusiasm for their preservation.

Unfortunately, the money available to conserve this species falls short of the budget required to eliminate all threats to which the malleefowl is exposed. How should we use this money wisely to achieve the greatest benefit possible? Which management action would be most cost effective, either fox baiting, reduction of grazing pressure or fire management? Which patches of habitat where the malleefowl occurs, ie national parks or fauna and flora reserves, would be most suitable to apply these management actions, given the differences in current management actions, habitat quality and varying costs of management across all sites? Finally, which management options at specific sites should be addressed first, considering the urgency of the associated threat? These questions on resource allocation are fundamental in deciding how best to conserve a species cost-effectively.

A decision-making framework using the principle of return on investment (ROI) has been developed to allow conservation managers to prioritise between management actions that achieve the greatest outcome possible for every dollar available. For my Honours project at the University of Queensland, I am investigating ways to improve the recommendations that are produced by this ROI framework. In reality, a threatened species may not respond to the applied management actions as expected, possibly due to interactions with ecological factors or other threatening processes. The factors that may enhance or diminish the malleefowl's response to a management action include rainfall, years since fire, habitat quality, and the number of foxes, rabbits, goats and other herbivores present. I am including these factors into the ROI framework to determine if our assumptions on how malleefowl will respond to management actions are valid.

While I am using malleefowl as an example, this framework is applicable to any other threatened species or ecosystem. My research will assist conservation managers to prioritise with greater confidence how, where and when to implement strategies to conserve a species effectively and efficiently with a budget constraint. I encourage you to look out for the results of this study in the future.

A malleefowl mound.

I would like to thank WPSA for funding my field trip to Victoria to better understand the practical aspect of malleefowl conservation and to ensure that my research is applicable to management practices. I would also like to thank my supervisors, Prof Hugh Possingham and Dr Kerrie Wilson, for all of their guidance, support and patience.

A malleefowl working on its mound.

A malleefowl chick.

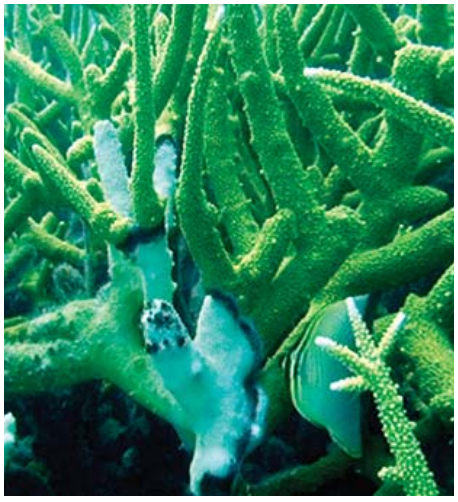
To mark the Centenary of the Wildlife Preservation Society of Australia in 2009, previous recipients of the University Research Grants were eligible to apply for a $5,000 Centenary Grant based on the applicant's progress in the project for which the initial grant was awarded.

The following articles are contributed by the winners of the two Centenary Grants

The control of coral disease by coral-feeding fish

Andrew Cole, PhD candidate, ARC Centre of Excellence for Coral Reef Studies, James Cook University, Townsville

The world-heritage listed Great Barrier Reef (GBR) is the largest continuous reef system in the world, home to millions of reef-associated species that depend either directly or indirectly on hard corals for survival. Hard corals around the world face a number of stressors, including outbreaks of crown-of-thorns starfish, global warming, over-fishing and coral disease. Traditionally, coral disease on the GBR has been negligible, however within the last decade the number of reefs suffering from coral disease has increased substantially. The impact from coral disease differs from other stressors, which give the coral community a chance to recover between subsequent disturbances. Most coral diseases follow a similar pattern, where a band of disease marks the boundary between live healthy tissue and dead skeleton. This disease band moves along the diseased colony in the direction of healthy tissue at variable but potentially rapid rates.



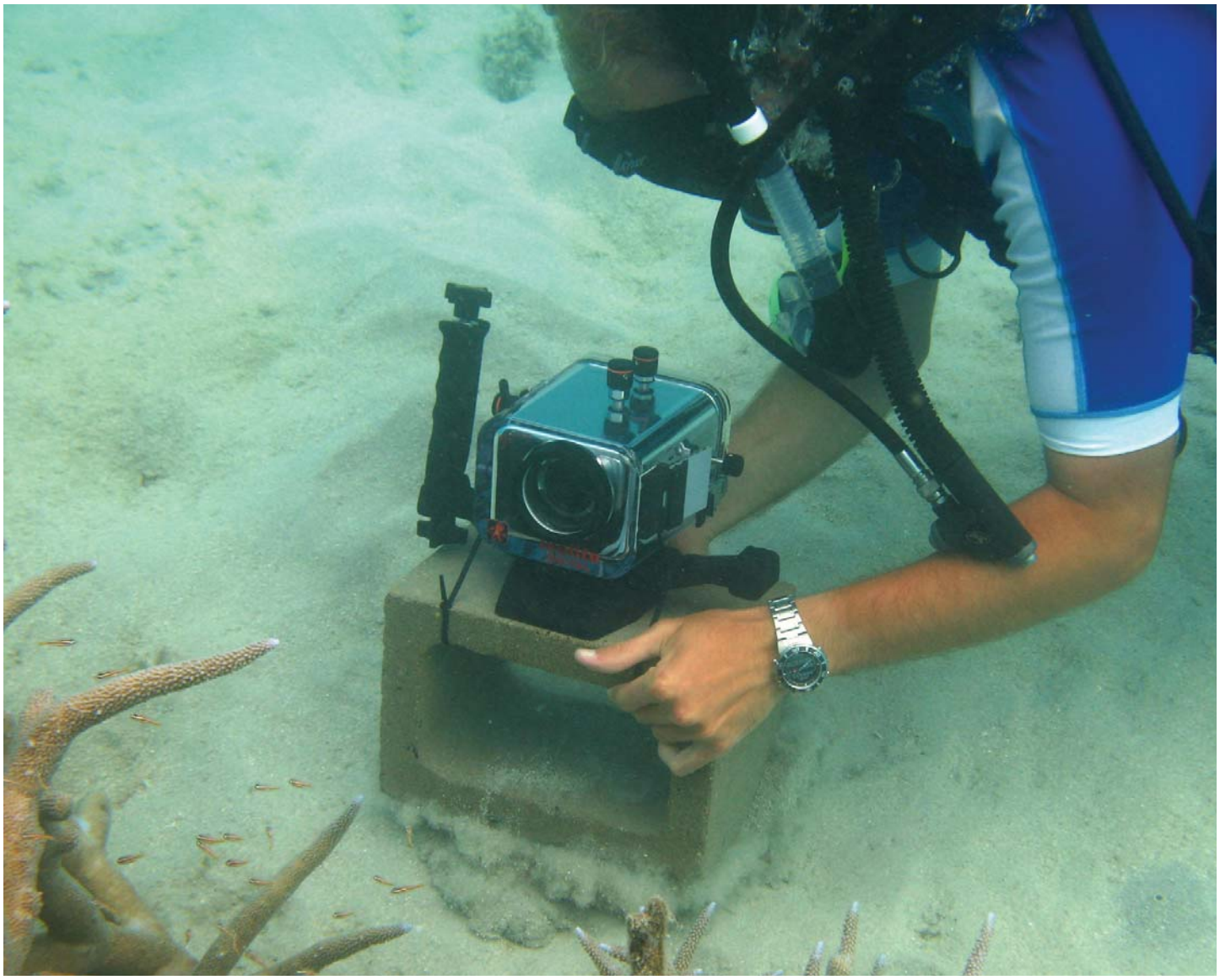
Chaetodon baronessa feeding on a black-band infected coral

Andrew Cole driving a boat away from Lizard Island Research Station

Around Lizard Island (northern sector of the GBR) the two most common coral diseases are black-band (caused by filamentous cyanobacteria) and brown-band disease (caused by a ciliate). These diseases cause a distinctly coloured band of cyanobacteria (black-band) and ciliates (brown-band) which can move through a coral colony at rates of up to two centimetres per day.

Coral disease is a long-term stress on coral populations with potentially far-reaching and devastating consequences for the ecosystem. Reduction in the number and diversity of hard corals negatively impacts all species that associate with coral reefs and ultimately reduces diversity and productivity of these ecosystems. Presently, there is no method to treat infected coral colonies.

My research is investigating the potential of coral-feeding fishes to act as biological controls in limiting the virulence and transmission of coral diseases. It is possible the fishes that typically feed on coral polyps may consume the diseased portions of affected colonies, ultimately reducing



Andrew Cole positioning an underwater video camera at Lizard Island

the virulence of these diseases and improving the chances of survival for corals.

Thanks to a University Students Grant from the Wildlife Preservation Society of Australia, I was able to undertake a five week field trip to Lizard Island Research Station in November 2008 to begin studying the interactions between coral-feeding fishes and coral disease. During this field trip, twenty colonies of *Acropora muricata* (staghorn coral) infected with black-band disease were filmed in order to observe the interactions in a field environment, unhindered by human presence.

The coral-feeding butterflyfishes, *Chaetodon baronessa, C. aureofasciatus, C. plebius, C. rainfordi, C. lunulatus* (F: Chaetodontidae) and the coral-feeding tubelip wrasse, *Labrichthys unilineatus* (F: Labridae) were observed to feed directly on the diseased band of naturally-infected *Acropora muricata* colonies. These videos indicate that coral-feeding butterflyfishes seemed to prefer to feed on the diseased band, in preference to healthy tissue on the same coral. Following these observations, a laboratory study was undertaken to test if predation by coral-feeding fishes could slow the progression of these diseases. The results from this pilot study were encouraging and showed that *Chaetodon plebius* fed very intensively on the black-band of diseased corals, and actually acted to slow the progression of this disease. After one hour of intense feeding, the diseased band had been partially removed and thereafter the band failed to progress along the branch. In control nubbins which were not exposed to feeding, however, the disease continued to progress along coral branches at a rate of 24.06mm day^{-1} and resulted in coral death. This experiment demonstrated that black-band disease could be removed under high intensities of predation. These results are encouraging and will be further investigated this summer thanks to continued support from the WPSA University Student Centenary Grant. We will expand this study to include brown-band disease and will also include a further two species of corallivorous fish. By studying interaction between three widely abundant coral-feeding fishes from two different families; *Chaetodon aureofasciatus, Chaetodon plebius* (F: Chaetodontidae) and *Labrichthys unilineatus* (F: Labridae) and incorporating the two most common coral diseases on the GBR (black and brown-band) will help to assess the generalities of the previous findings and their applicability to coral reef management.

The Dingo is the key to endangered species survival


Arian Wallach

Arian Wallach[1,2] and Adam O'Neill[2] [1] School of Earth and Environmental Sciences, The University of Adelaide, South Australia [2] Rangeland Research and Restoration, C&A Environmental Services, Mt Perry, Queensland

Invasive species have been implicated as the main drivers of extinction and land degradation since European settlement. Wildlife managers have reacted to this crisis by implementing large-scale and intensive pest control measures. Poison-baiting with the toxin 1080 is the most common method of control, with approximately 200 kg of raw poison used anually in Australia. Other control methods include rabbit warren destruction (fumigation, ripping and blasting), shooting, trapping, spread of disease agents (eg calicivirus), surgical sterilization and immunocontraception. In many National Parks, aircrafts are used to distribute poison-baits and shoot large herbivores. But, despite the scale and intensity of pest control applied throughout the continent, there is little - if any - reliable evidence in support of this practice. Rather, recent studies indicate that wildlife population control may be counter-productive and harmful, whether the animal targeted is native or feral.

Our ecological philosophy follows the premise that once an exotic species has successfully integrated into an ecosystem, we should not attempt to remove it. Instead, we should apply strategies that promote the inherent strengths that enable ecosystems to maintain resilience to change. Across the globe, and in every habitat investigated, researchers are finding compelling evidence for a keystone role of large (top) predators in enhancing ecological resilience to perturbations such as alien invasions and climate change. By suppressing the abundance and changing the behaviour patterns of invasive and over-abundant species, top predators protect threatened species and vegetation communities. Examples are too numerous to count but include the demonstration that coral reef survival depends on sharks; vegetation recovery follows the reintroduction of wolves; kelp forest ecosystems depend on sea otters; and in Australia the survival of threatened species depends on dingoes.

Top predators provide a service that acts to regulate ecosystems in a sustainable manner, their influence enhances ecosystem health, biodiversity and productivity. Our intervention on the other hand tends to create a situation that requires a cascade of remedial intervention on an escalating scale. The more we pry into natural processes the more difficult it becomes for nature to operate in a self-sustaining fashion. If there is any role for us to play in the management of wilderness areas, it is to protect large predators and their habitats. We cannot assume the ecological roles of dingoes, wolves and lions. It is time for us to step back and return wildlife management to wildlife.


This dingo was born into a stable pack at Lake Eyre and has been well cared for


Adult dingo and pup, together in one of the rare places in South Australia where dingoes are not persecuted

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"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.

PATRICK W MEDWAY AM
National President

WPSA Merchandise

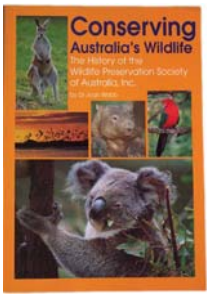
Many of our members have expressed interest in purchasing gift merchandise for friends and family (or even themselves)! This is a great way to support the Wildlife Preservation Society of Australia, so we have responded below with a mail order system. Simply send your cheque or credit card details (with 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)

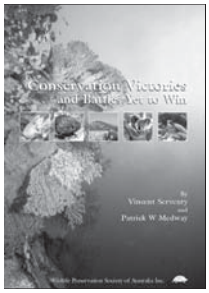
Kids T'Shirts - $10
(Navy with white logo / White with navy logo)

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

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Drink Bottle Bag	_____	n/a	$10	_____
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Bucket Hats - $10
(Brushed Twill)
Adult: 70cm (Medium/Large), 80cm (Large/XLarge))
Child 50cm (Small), 60cm (Medium) -
with elastic sizing band and toggle

Pen - $5

WILDLIFE PRESERVATION SOCIETY AUSTRALIA

Celebrating our centenary
1909 - 2009

Plastic Travel Mug - $10

Caps - $10
(Adjustable - One size fits all)

Product	Quantity	Size	Cost per item	Total
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Bucket Hat (Child)	_____	50cm, 60cm	$10	_____
Caps	_____	n/a	$10	_____
Pen	_____	n/a	$5	_____
Plastic Travel Mug	_____	n/a	$10	_____
2009 Centenary Calendar	_____	n/a	$10 reduced to $5	_____

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Centenary celebrations

South Australian ministerial reception

Diane West, Dr Chris West (Chief Executive Zoos South Australia), Patrick Medway and The Hon Jay Weatherill MP, Minister for Environment and Conservation

Lee Haddon and Trudi Coen

Angela Hawdon (Special Projects Coordinator, Nature Foundation SA) and Peter Shaughnessy (South Australian Museum)

L to R: Maralyn Hignett, Angela Pestell (Department of Environment), Helen Waudby (recipient of WPSA University Grant), Cliff Hignett (Natural History Society of South Australia) and Chris O'Loughlin (Natural History Society of South Australia)