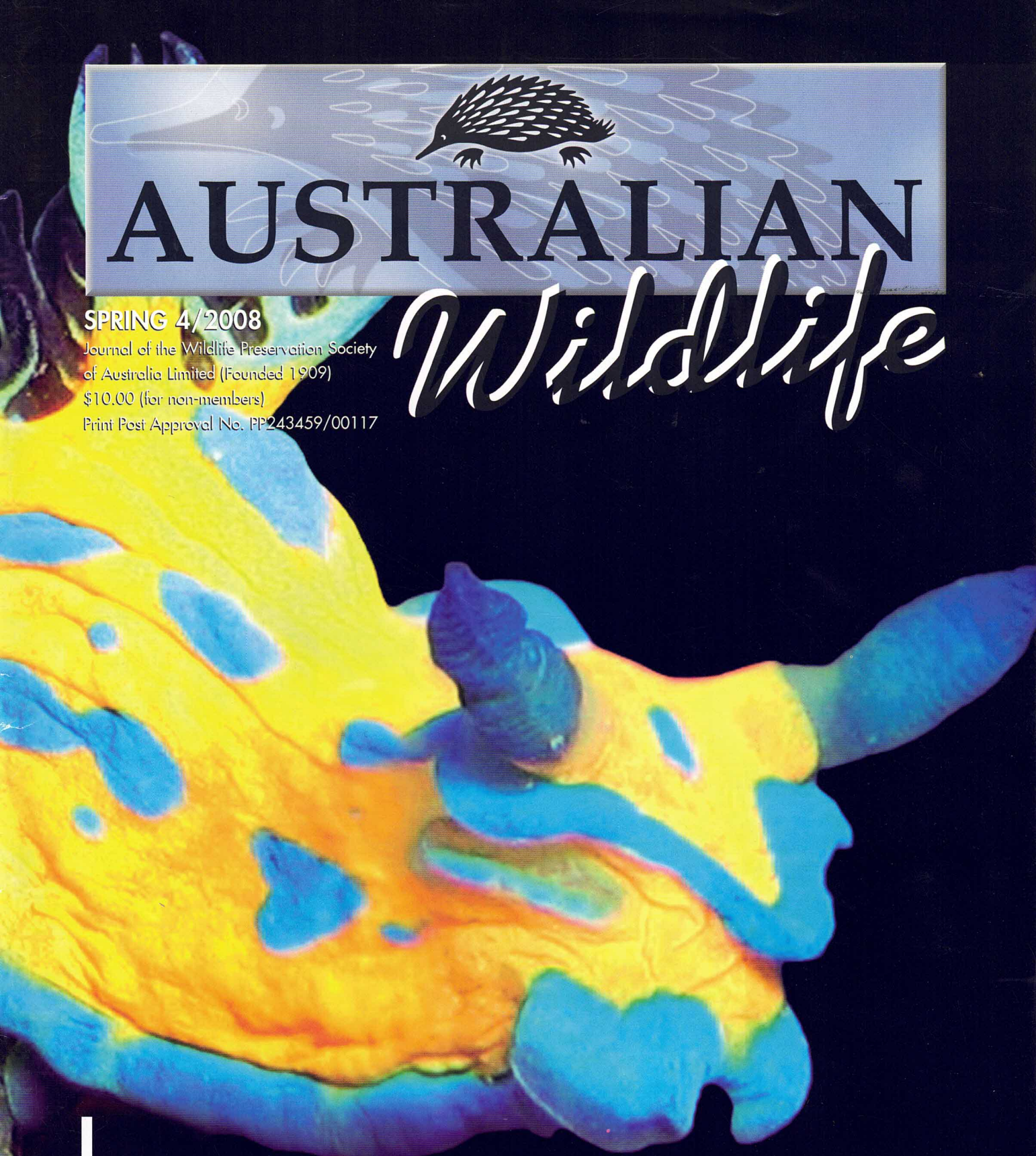
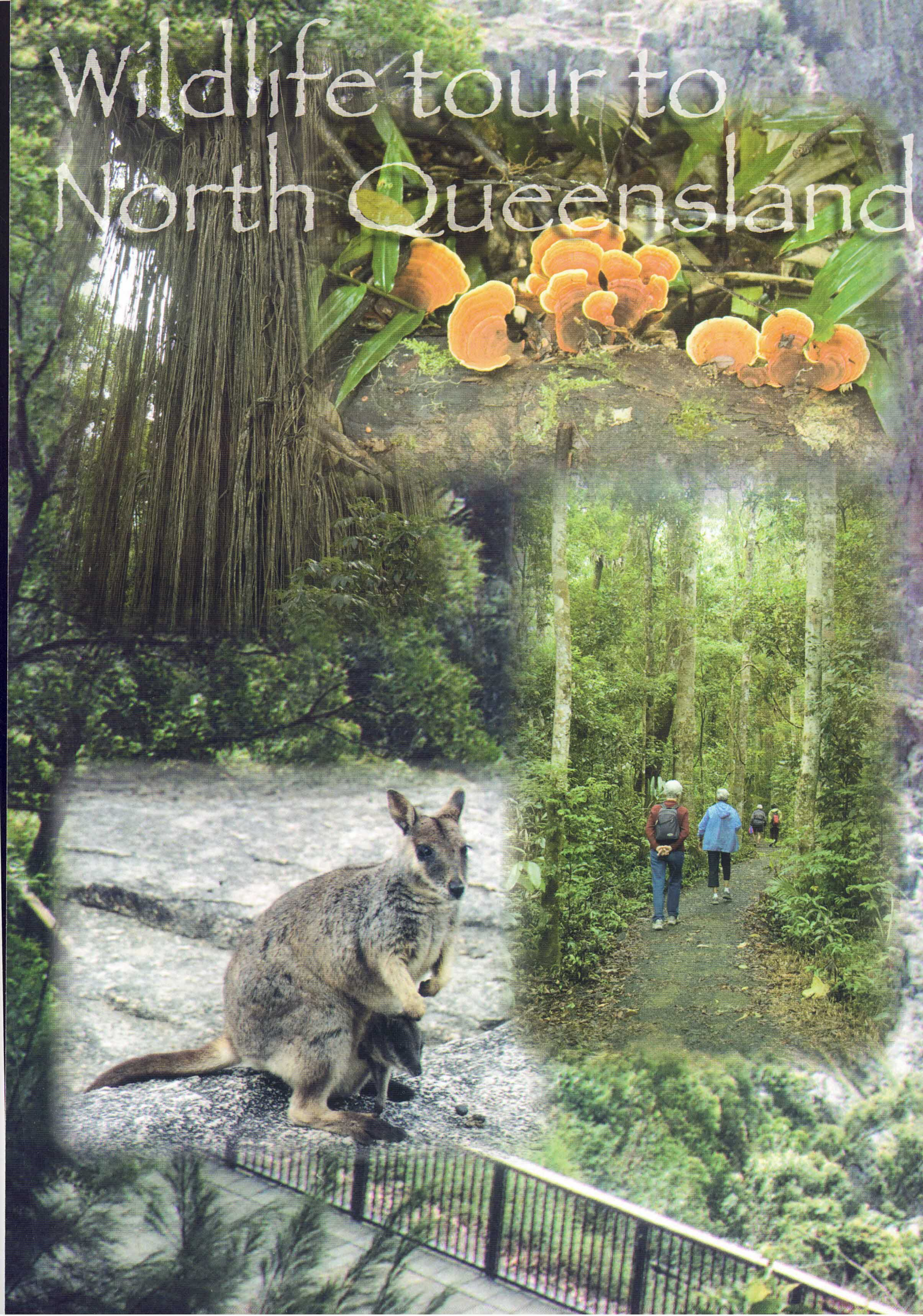
AUSTRALIAN Wildlife

SPRING 4/2008
Journal of the Wildlife Preservation Society of Australia Limited (Founded 1909)
$10.00 (for non-members)
Print Post Approval No. PP243459/00117



Cover photo: nudibranch (Tambja verconis), Sorrento Pier, Port Phillip Bay, Victoria
Photographer: David Maynard

Wildlife tour to North Queensland



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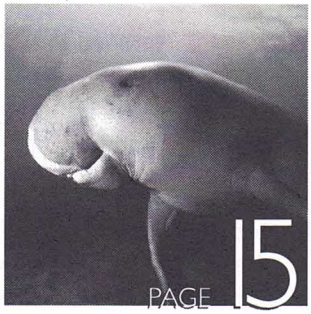

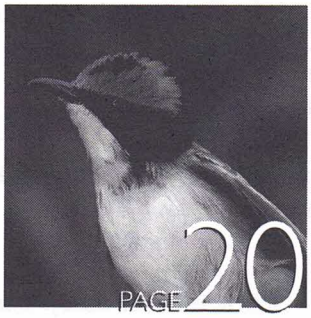

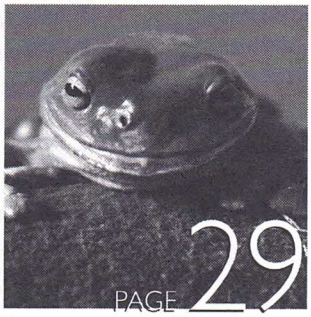

WILDLIFE PRESERVATION SOCIETY AUSTRALIA

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.

Print Post Approval No. PP243459/00117

Price $10.00 (for non-members)

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DIRECTORS 2008

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All articles are written by Suzanne Medway unless stated otherwise. Articles and comments expressed in this magazine do not necessarily reflect the opinions of the Editor, Society or members. Articles contributed from outside sources are included for the reading enjoyment of members and to encourage discussion on different points of view.

From the President's Desk...

Wattle Day 2008

We are delighted that Wattle Day is back on the annual calendar for schools and the public across Australia. As the wattle flower is our national emblem and closely associated with the national colours of green and gold so prominently displayed by Australians at the recent Olympic Games in Beijing, such a special day focuses on the urgent need to retain vital native habitat for our precious wildlife. Wattle Day reminds us all of the continuing need to better manage our land and its natural environment, to plant more native trees and to care for those native trees we already have across this great land.

2009 Wildlife Calendar

As part of our Centenary celebrations for the Society, we have produced a wonderful native wildlife calendar for everyone to use. Produced by our Editor Suzanne from fantastic photographs taken from recent editions of our ***Australian Wildlife*** magazine, the calendar is being distributed in October with the Spring edition of our ***Australian Wildlife*** magazine.

Every member is invited to assist with the wildlife conservation work of the Society by purchasing copies of the **2009 Centenary Wildlife Calendar** for family and friends as a Christmas gift. Please see the order form in the magazine.

Australian Mammal Society Conference

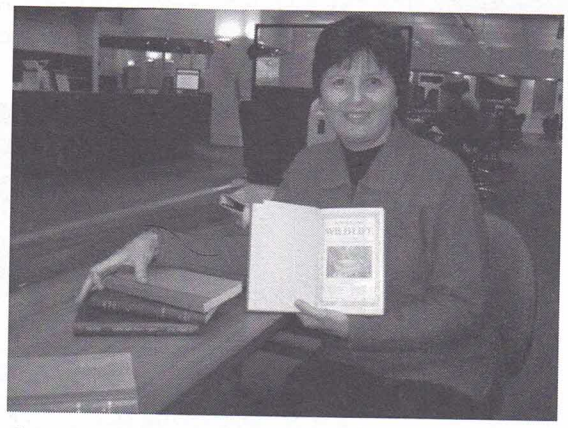
Our Society was again represented at the 54th Scientific Conference and 2008 Annual General Meeting of the Australian Mammal Society in Darwin. The Conference had a strong wildlife and mammalogy conservation theme, and it is always good to see successful young student members who were the recipients of our University Student Awards making professional presentations on our native wildlife. Such conferences enable our Society to present our wildlife conservation message to a very focused wildlife conservation group.

Invitation to Lord Mayoral Receptions

A number of Lord Mayors of the capital cities around Australia have agreed to host a Civic Reception for members and local conservation groups to mark our 2009 Centenary. Any member who would like to receive an invitation to their nearest capital city Lord Mayor's Civic Reception is asked to contact the National Office to ensure their names are added to the official invitation lists.

Visit to the National Library in Canberra

We recently visited the National Library of Australia while researching the early history of the Society and its formation in 1909. We were truly delighted with the very kind assistance of the staff of the Library who were very helpful in finding early editions of our Society's magazine ***Australian Wildlife***. As we read the contents of the early editions prepared and written by David G Stead and Thistle Harris, among others, we were intrigued to learn that much of the subject matter of that time is still an issue today. Land clearing, the destruction of native vegetation and native wildlife, attempts to change the zoning of parks and reserves for commercial development, the illegal export of native animal products such as skins and feathers, illegal shooting of protected native animals and the urgent need to seek more members to help with the important wildlife conservation work of the Society.



Suzanne Medway with the first edition of Australian Wildlife printed in 1934

Writing the history of the Society

We have again engaged Dr Joan Webb to complete the history of the wildlife conservation work of the Society from 1909 to 2009 after her wonderful work in writing up the first eighty one years in 1990. We are still interested in receiving copies of early editions of the Society's magazine or newsletters prior to 1960. If anyone has copies of any early editions, could they please contact the National Office with the details.

Patrick W Medway AM
NATIONAL PRESIDENT

Wildlife study tour to North Queensland

by Carol Nolder

The superstitions surrounding Friday the thirteenth played no tricks on us on the first day of our tour! We all met up at Cairns airport as arranged, having travelled from various points. Leaving Cairns, we passed mile after mile of sugar cane plantations, with harvesting being carried out and the crops piled high on the slow moving trains alongside the road, with only a narrow width of grass between us! We continued along the Gillies Highway, with over three hundred bends as we went up higher in the forest regions, with spectacular views in all directions. With a short stop in Yungaburra to collect milk and a few breakfast items, we were introduced to our holiday destination, the 'John Chambers Rainforest Lodges'. We rapidly spread ourselves around the various lodges that were to be our homes for the next week, before we set out to investigate our new surroundings. Familiar brush turkeys and pademelons ran across the paths in front of us, but the calls of many others like the catbird and the riflebird sounded very strange!

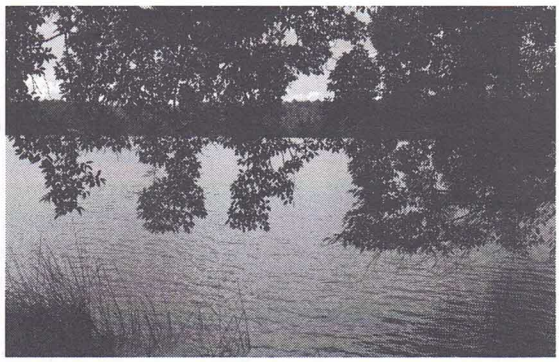
Edward Sparrow, Carol Nolder and Ralph Campbell at Mount Hypipamee National Park

Sitting down to a cooked meal prepared by the staff was a luxury on our first evening, when John Chambers gave us a talk about the property and what we would see over the next few days. As the light faded, he was feeding the red-legged pademelons with pieces of potato and sweet potato, talking all the time about the local wildlife. The large recreation centre was just wonderful – apart from all the cooking, refrigeration and storage facilities, there was a billiard table, a heated spa and a swimming pool, all within a stone's throw of our units. Needless to say, at the end of the evening, we all dropped into our beds tired but happy!

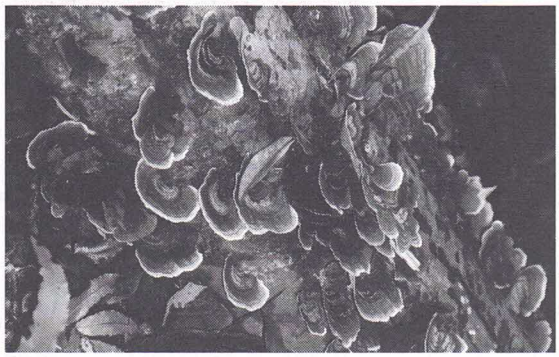
Red-legged pademelons

Next morning we set off to walk around Lake Barrine, about 4.5 kilometres. This crater lake had a boardwalk around the water that made for easy walking, with the giant kauri pines being of particular interest. The myriad of colours of the fungi on fallen trees and branches on either side of the path was truly amazing and also the surprising number of wildflowers in bloom. We stocked up on local maps and postcards at the Visitor Centre, before returning home for lunch.

View of Lake Barrine

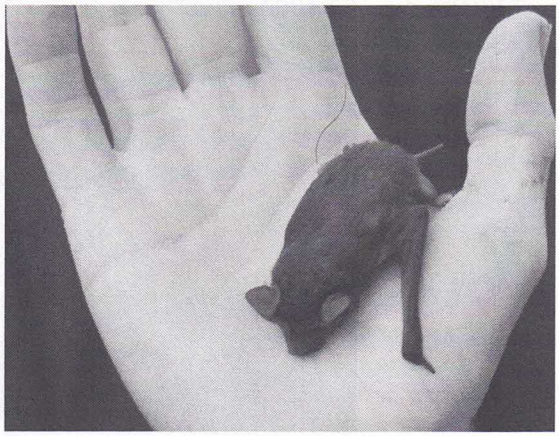


View of Lake Barrine



The cauliflory (flowers growing straight from the trunk) was on a yellow mahogany tree (Dysoxium parasiticum) on the walk to the crater

In the afternoon we went across the Atherton Tablelands to visit Tolga Bat Rescue and Research, which was deemed to be one of the highlights of our week. We were enthralled to hear about the sheer dedication of Jenny Maclean and her volunteers, learning about the continual rescue and remedial work carried out and seeing the huge quantity of fruit that was cut up each day for their food. (This was such an outstanding visit and Judy May, who made the introduction for us, has written a separate article about it, which I know you will all appreciate.) We watched as the resident bats were fed, most of them unable to fly due to wing damage, and I for one was amazed at the tiny microbats that Jenny held in the palm of her hand.



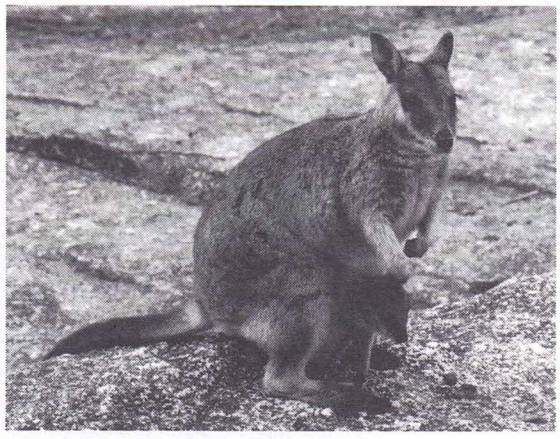
Microbat on Jenny McLean's hand

Sunday was our day to visit Cairns, starting off at the superb Botanic Gardens, with colourful plants in a huge variety of shapes and colours. The pitcher plants were truly fascinating, as were the spectacular butterflies. At this point, some of our members chose to carry on across the boardwalk to the Centenary Lakes, while others opted to spend some time looking round the markets and Cairns itself. That evening, after watching a platypus, we also saw a couple of turtles and some sugar gliders we came back to the Visitor Centre to talk over the events of the day and to try our hand at John Sparrow's trivia questions. Some of us discovered to our shame that we knew absolutely nothing about a couple of the subjects!

John Clarke,John Sparrow, Edward Sparrow and Dick Mason

We set off the next day to visit Granite Gorge, where we were introduced to the rock wallabies. They kept together in small family groups, but did not hesitate to come up to us to be fed. This colony is quite isolated and grazing very sparse, so they are fed by the rangers to ensure that they remain fit and able to continue breeding. We scrambled over the rocky paths to see the spectacular views of the waters tumbling down the Gorge and then enjoyed a quick cup of welcome coffee before we headed off to the Mareeba Wetlands. Mareeba is the largest town on the Tablelands and members will recall that our Society made an Award to this group three years ago. The whole area was most intriguing and we split into groups as the afternoon was divided into two, with each of the groups going in turn by boat across the wetlands and a walk around the property. Once again, we marvelled at the sheer dedication of the rangers, who obviously took great pride in their achievements. Skimming gently across the water, we heard all about the birds and plants that make this area their home, and the changes that occur during and after the wet season.

Our group at Mareeba Wetlands



Red-legged rock wallabies at Granite Gorge

Wandering round the natural parkland afterwards, we studied the huge mounds made by the grass termites, keeping away from the holes in the ground where we knew large spiders were lurking, and smiled as we passed the toilets where the bolts were on the outside of the doors - to keep the wildlife out, not us! A Gouldian finch breeding program is being carried out here and it was interesting to see close up the different natural colours. The adult birds are moved into an open aviary that allows them to fly free and eventually to move out when they are ready to do so.

Edward Sparrow with the grass termite mounds

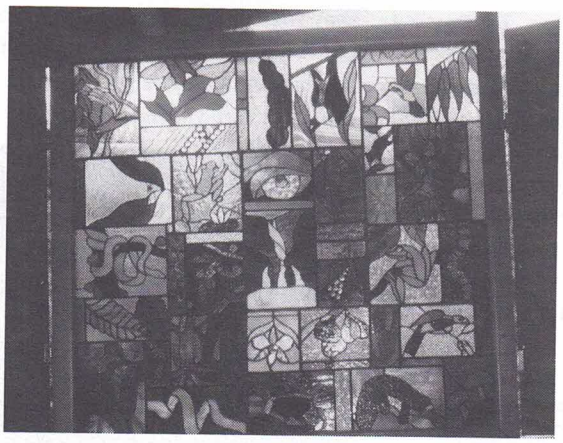
Mike Augee, our tour leader, had arranged for us to visit a mango farm and winery one day, and we were quite surprised to find that the wines, apart from the very sweet ones, held no flavour of mango at all. The liqueurs were quite superb and we were informed that they were excellent on ice cream! Another unusual place we went to was a coffee plantation and associated retail section, which was interesting and informative, and a source of unusual gifts to take home! Another particularly fascinating place that we went to was the observation enclosure at Hastie's Swamp. Here, magnificent views across the wetlands allowed us to see countless waterbirds, with many pictures and descriptions around the inside walls to enable us to identify them.

We had been hoping to travel up to Port Douglas one day, but when Mike phoned through to check on the conditions up there, we learned that torrential overnight rain had made some roads impassable for our coach, and because of the prevailing high winds, all the cruises had been cancelled. However, with such a choice of places to visit, it was easy to change our plans. We started off at Kuranda, which had a myriad of very attractive shops and stalls and a host of eateries to choose from. The Atherton Tablelands is a plateau region with long drives in rich farming areas, large volcanic lakes and stunning waterfalls on the Barron River. Most intriguing were the enormous fig trees – we went to see both the 'Curtain' and the 'Cathedral' trees during our holiday. The tree starts its life when a seed is deposited in a branch of the host tree where it germinates, and the first root descends to the soil below. Enriched by the soil, the fig tree develops aerial roots that encircle and eventually strangle the host tree. With the curtain fig, the dead host tree fell into a neighbouring tree, when vertical fig roots descended from the trunk to form the curtain-like appearance. Eventually, the host tree rots away, leaving the free-standing fig tree.

Stunning views across the Barron Falls

Cathedral fig tree – over five hundred years old

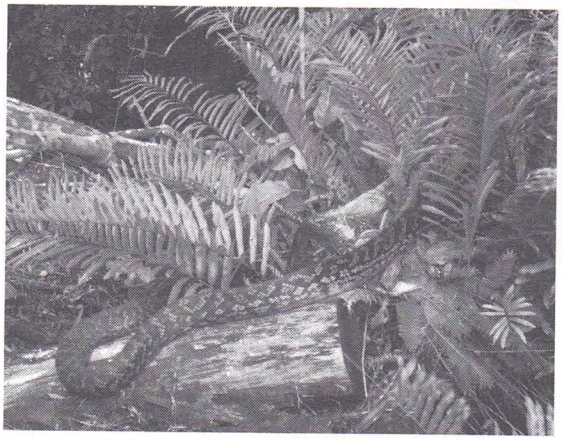
On our last morning, we set off to walk around Lake Eacham. Each area of rainforest that we visited during our holiday seemed to have its own magical feeling, and this was different again. The Visitor Centre, with its stained glass panels, and the large plant nursery with a team of rangers and volunteers was a hive of industry!



A superb stained glass panel at the Lake Eacham Visitor Centre

As we were driving home through the Lodge property that evening, just as the light was failing, we spied a python progressing slowly across the roadway. As it slithered gently up the bank, we estimated it to be about twelve feet long. Talking to John Chambers later, he told us that it would have been an Amethystine python and that the largest one on the property, where he had been for thirty five years, was about twenty four feet

Some of our group on the walk round Lake Eacham where we saw many beautiful fungi including the brackens shown



Amethystine python

All too soon, the time came to pack up and leave this wonderful area, albeit with many happy memories and hopefully plenty of photos to show our friends back home. Six of our group continued northwards to Cape Tribulation, we enjoyed a trouble free flight back home – and the shorter evenings. A big 'thank you' to Mike Augee, Christine Robinson and Chris George (who drove our backup vehicle and was our relief bus driver and assistant cook) for a wonderful trip!

Visit to Tolga Bat Rescue and Research

by Judy May, Director

Whilst on our wildlife study tour to the Atherton Tablelands we spent an enjoyable afternoon visiting the Tolga Bat Hospital. The Centre is run by Jenny Maclean and a band of volunteers. They are sometimes assisted by overseas students who come to the centre to study flying foxes and bats.

The Centre specialises in bat rescue and rehabilitation and also provides a lifetime sanctuary for those bats that cannot be released back into the wild. The Centre is run by volunteers. They

have about fifteen to twenty locally based carers and a couple of live in volunteers. They do all their own fund raising and rely on donations to build facilities and feed the bats.

The Tolga Bat Centre has world class facilities set on five acres of land. The land is owned by Jenny and the bat section takes up about quarter of an acre. Jenny has converted her home to accommodate the Bat Hospital and Centre and is currently adding an education centre.

Jenny gave us an hour long talk and then we visited the flying foxes and bats that she had in care. We went down to the large walk-in aviary where the flying foxes are housed, including the bats that are in permanent care. They have grey headed, black headed, spectacled and little reds in care. Jenny gave us a close up look at the bats and allowed us to take photos. Then we were shown the little insectivorous bats that were in care. These bats were about the size of a small mouse and they have a separate aviary.

The Centre goes through an enormous amount of fruit and they buy their apples by the truckload, which is shipped up from Brisbane. Local farmers supply them with free bananas. They have about one thousand bats come through their system a year. Last year they received five hundred baby flying foxes in and had to send them to various parts of the state to be raised by other carers. These bats were then sent back to the Centre to be housed in a pre-release aviary.

At the Centre they provide education, habitat restoration, research and advocacy. They microchip all the bats that come into their care for research.

We came away more aware of flying foxes and bats and the problems they face in the wild. A few people commented that the day had changed their perception of bats and that they were impressed both with the Centre and the people running it.

Spectacled flying foxes at feeding time

The Australian Network for Plant Conservation Conference 21-24 April 2008

by Dr David Murray, Vice President

This article continues my account of issues presented at this Conference, titled *Our Declining Flora – Tackling the Threats*, which was featured in the winter edition of *Australian Wildlife*.

Here is Threat 3 – Weeds.

Weeds reduce biodiversity by excluding native plant species from their rightful habitats. They can do this by shading or covering native plants, or simply occupying space, and spreading or expanding their range. Some are alleged to release suppressive or toxic compounds from their roots. Weeds have always been an important threat to Australian native plants, and when toxic, like Crofton weed, Johnson grass, or Mother of Millions, they pose a direct threat to animals as well. At the heart of the problem is the fact that many weeds are too widespread to be eradicated, for example, privets, lantana and blackberry, all spread by birds ingesting fruits, then defecating viable seeds over considerable distances. At best such weeds can be controlled, and removed from selected areas. This requires patience, persistence, and money. Often such plants are not declared under state legislation, although they may instead have been nominated as Weeds of National Significance under the federal system, like lantana.

Dr David Murray

Faced with a weed-infested area of native bushland, what can be done? Bush regenerators have long been taught to work from areas of light infestation towards the thickest, as in the Bradley Method. Andrew Crompton from South Australia explained the virtues of working with "small, quality sites". By not starting with too large an area, the complete absence of weeds can be achieved by making repeated visits to remove all weeds, protect natural regeneration, and introduce seeds and plants of appropriate local species. Participants need to be knowledgeable, and to help this come about, he recommended thorough documentation of 'look-alikes', weeds that look like native plants.

But what if the weeds are overwhelmingly dominant? As a first step in areas lacking tree or shrub cover, native trees can be planted. They will grow and provide shade that will then slow down the growth of lower story weeds, especially annuals. At very least the trees will support birds and possums, and the time may come when more exacting weed removal can take place. An example of this approach was shown to us by Greening Australia at their site at Mamre, the original property of the Reverend Samuel Marsden. The tract of land they are restoring has one boundary along a bank of South Creek, ie it is a riparian zone.

Other riparian zones we were shown included one location on Mulgoa Creek, Regentville, flanked by a steep shale cliff that had been infested with African olive (*Olea africana*). These trees were removed by specialists on ropes, the project being supported by a grant. This weed has been a 'sleeper' since its deliberate planting in the 19th century, but it is now abundant in many parts of the Cumberland Plain. Peter Cuneo from Mt Annan Botanic Garden showed how many dense infestations had developed rapidly over the past twenty years, to the extent that they are large enough for detection using satellite imagery. Incidentally, the fruits of the African olive are smaller than those of the cultivated European olive (*Olea europaea*), so the seeds are readily passed by birds. It would be interesting to relate the spread of African olive to any changes in bird populations over the past twenty years or so.

Paul Gibson-Roy from Melbourne described the growth of native grassland by direct seeding. As a pre-requisite, he chose several areas of agricultural land and scraped away the top soil. This had a dual purpose – to remove the seeds of potentially competing weeds, and to reduce the high nutrient content. This approach was extremely successful, yielding thirteen hectares of species-rich grassland in all.

Selga Harrington described the changes to Wingecarribee Swamp NSW resulting from its collapse in 1998. A large channel now runs the length of the swamp, and many areas of peat have dried out. A major invasion of willow (*Salix cinerea*) has occurred, resulting in about one million trees. Removal of salix is now being implemented, the methods depending on the proximity of threatened species – three plants, and the giant dragonfly (*Petalura gigantea*).

Dianne Brown from the Department of Environment and Climate Change (NSW) presented an overview of plans to protect biodiversity on Lord Howe Island. So far as weeds are concerned, the cherry guava has been almost removed. The worst weeds currently are Crofton weed, tigerlily, kikuyu and buffalo grasses.

Finally, new procedures for tackling widespread weeds were discussed. Paul Downey and Peter Turner outlined the results of listing individual weeds as Key Threatening Processes, which is permitted by the NSW Threatened Species Conservation Act 1995. This was done first for bitou bush (*Chrysanthemoides monilifera*) in 1999. A Threat Abatement Plan was prepared, which entailed determining the biodiversity at risk. Plants normally found on dunes or in forests with sandy soils are most at risk, especially as bitou bush invades undisturbed areas as well as disturbed sites. Among the treatments for bitou bush, two introduced biological agents have proved most effective: the bitou tip moth (*Comostolopsis germana*) which destroys developing leaves, buds and flowers, and the bitou seed fly (*Mesoclanis polana*) which consumes developing seeds. Both of these agents halt seed production, which is critically important. Bitou bush flowers year round and a single plant can produce 50,000 seeds in that time. Several other biological agents have not so far been successful, and others are being tested.

The second weed for which the above procedure has been followed is lantana. Wildlife Preservation Society members who belonged to the Friends of Towra Point Nature Reserve and who took part in the clean-up of Towra Point from 1996 onwards will be thoroughly familiar with this weed. The National Heritage Trust Weed Management Guide on lantana claimed that it is 'not very shade tolerant', which is unfortunately not true. Lantana is often found as an understory to taller vegetation. Despite this glitch, more than two hundred plant species and many ecological communities have been identified as being at risk from lantana. This leaflet also describes how four insects have had a major impact on lantana as 'biological controls'. These are: a sap-sucking bug, *Teleonemia scrupulosa* (Sydney to northern

Queensland); a leaf-mining beetle, *Uroplata girardi* (Sydney to northern Queensland); another leaf-mining beetle, *Octotoma scabripennis* (Sydney to south of Rockhampton); and a seed-feeding fly, *Ophiomyia lantanae* (southern NSW to northern Queensland).

For lantana, it remains to prioritise invaded sites 'based on the level of threat and the likelihood of reducing the threat of lantana at each site'. From my own experience on the Noxious Weeds Advisory Committee from 1993 to 2003, I can tell you this is the hard part - harder in fact than actually removing the weeds.

As a post-script, here is a list of plants that I recommend be removed from home gardens, or otherwise handled with great diligence. This was published as Table 9 in my book *Successful Organic Gardening* (2nd edition, 2006):

Vines

Ipomoea indica - morning glory

Ipomoea carica - mile-a-minute plant

Araujia hortorum - moth vine

Caesalpinia decapetala - Mysore thorn

Cardiospermum grandiflorum - balloon vine

Anredera cordifolia - Madeira vine

Lonicera japonica - Japanese honeysuckle

Jasminum polyanthum - jasmine

Thunbergia alata - black-eyed Susan

Protasparagus plumosus - climbing asparagus

Myrsiphyllum asparagoides - wedding creeper

Delairea odorata - Cape ivy

Hedera helix - English ivy

Trees

Oxalis pes-caprae - soursob

Ligustrum lucidum - Large-leafed privet

Ligustrum sinese - Small-leafed privet

Cinnamomum camphora - camphor laurel

Phoenix canariensis - Canary Island date palm

Senna pendula - cassia

Erythrina crista-galli - cockspur coral tree

Others

Agave americana - Century plant

Alstroemeria pulchella - New Zealand Christmas Bell

Cestrum parqui - green cestrum

Chlorophytum comosum - ribbon plant

Chrysanthemoides monilifera - bitou bush

Cortaderia selloana - pampas grass

Genista species - broom

Hypericum perforatum - St John's wort

Bougainvillea - Bougainvillea

Bryophyllum tubiflora - mother of millions

Ochna serrulata - Mickey Mouse bush

Oxalis corniculata - yellow wood sorrel

Oxalis latifolia - fish-tailed oxalis

Protasparagus aethiopicus - asparagus fern

Cytisus scoparius - Scottish broom

Oenothera stricta - evening primrose

Crocosmia x crocosmiiflora - montbretia

Tradescantia albiflora - wandering Jew

Verbena bonariensis - purpletop

Saving bilbies

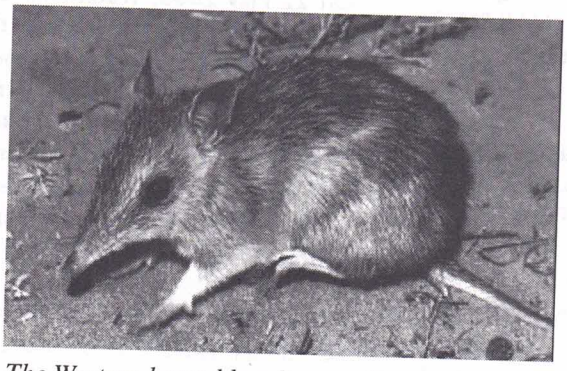
A unique partnership between a company that supplies sophisticated monitoring equipment to some of Australia's largest and remote pastoral properties and an organisation that is restoring native ecosystems is making impressive headway in protecting some of the country's threatened native fauna. The partnership is a collaboration between Arid Recovery and Observant Pty Ltd.

South Australian based Arid Recovery is dedicated to the restoration of Australia's arid lands. Its partners are BHP Billiton, University of Adelaide, the South Australian Department of Environment and Heritage, and Friends of Arid Recovery.

Observant is an Australian-owned company that develops remote monitoring solutions that enable customers to manage and observe far off equipment from any convenient location using only a computer, solar power and radio communications.

Arid Recovery's eighty two square-kilometre fenced reserve in the South Australian outback is home to an amazing variety of iconic and threatened Australian fauna such as burrowing bettongs, greater bilbies, greater stick-nest rats and Western barred bandicoots. These vulnerable species have been able to survive and multiply because feral cats, foxes and rabbits have been eradicated from the fenced reserve.

Greater stick-next rat (Leporillus conditor)



The Western barred bandicoot (Perameles bougainville)

By intensively managing cat and fox numbers around the reserve Arid Recovery can ensure the long-term survival of the reserve's valuable inhabitants as well as create potential for release of native animals such as the greater bilby outside the fence. Before the Observant technology was trialled in 2007, keeping tabs on the feral animal traps was a time consuming and costly business. Arid Recovery staff and an army of volunteers had to make daily trips to the reserve at first daylight to check the traps, even if they weren't set off!

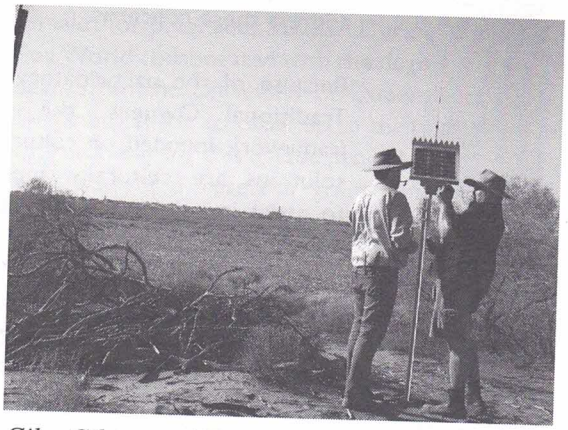
This is the first time an Observant system has been used outside the pastoral industry and the results have been very promising as the Observant system allows staff to remotely check the status of our traps at any time, enabling a more effective use of volunteer labour, and a significant saving in fuel costs. The system also helps pinpoint which traps need to be visited and what time they were set off, which aids management.

In early September 2007 twenty bilbies were released into an area west of the reserve that has twelve of the traps that are monitored by Observant equipment. Coupled with intensive management in the release area, these traps have so far been successful in keeping predators low enough to enable a population of bilbies to become established.

Arid Recovery uses twenty Observant units (one equipped with a camera) to monitor traps on the perimeter of the reserve, a base station and the Observant software at the site office to gather all the information. Further expansion of the system may include more cameras, an electric fence monitor and a web interface so that staff and volunteers can check the traps from any location that has an internet connection.

This project was also supported by funding from the South Australian Arid Lands Natural Resource Management Board (SAAL NRM).

Ecologist Helen Crisp releasing one of twenty bilbies. Photo by Chris McGoldrick



Giles Gibson and Tim Stockman installing Observant units. Photo by Melissa Farrelly

Torres Strait Regional Authority's Land and Sea Management Unit: Community based turtle and dugong management plans

by Janet Lanyon, Researcher, University of Queensland and David Blyde, Veterinarian, Sea World Research projects

The Torres Strait Regional Authority's (TSRA) Land and Sea Management Unit (LSMU) is supporting eight Torres Strait Island Communities in a Dugong and Marine Turtle Project that aims to assist indigenous Australians to become more involved in the sustainable management of dugong and marine turtle.

The project is one of a number of projects coordinated by the North Australia Indigenous Land and Sea Management Alliance (NAILSMA) and has five regional partners located in areas from the Kimberly to Torres Strait.

The primary aim of the Torres Strait project is the development of community based Dugong and Marine Turtle Management Plans. The planning process involving eight communities has been underway for almost two and a half years. The project has successfully developed eight draft dugong and turtle management plans, which has been made possible through the employment of Traditional Owners on each of the participating islands.

The planning process has documented Traditional Owner concerns for dugong and turtle management and through the use of participatory planning has developed a range of solutions to address these concerns.

Because of the participatory process involving Traditional Owners, the plans support a framework founded on cultural protocols. The solutions are culturally appropriate and aim to assist in reinforcing cultural values in island communities.

These plans utilise a combination of indigenous and non-indigenous management systems. Traditional Owners believe this is a good starting point from which to achieve and maintain sustainability in dugong and turtle populations in the Torres Strait. It is important that Traditional Owners have control over management and enforcement activities. The continuation of culturally appropriate hunting of dugong and turtle is central to the success of community based management of the fisheries.

Traditional Owners believe that the success of these plans depends on the establishment of island based ranger programs managed in co-operation with Elders who will undertake community awareness, education, monitoring and research activities across sea-related issues as well as across the broader area of natural resource management.

TSRA, through the Land and Sea Management Unit, has facilitated the involvement of a wide variety of government and non-government organisations in the project. Recently the TSRA coordinated a stakeholder consultation process, in which six of the eight draft plans were distributed to sixteen stakeholders. The response to the consultation was positive, with a number of federal ministers congratulating the Traditional Owners on the plans and offering support for the plans' implementation.

On 22 May 2008, Traditional Owners from the eight participating islands met with a number of key government and non-government stakeholders to discuss the outcomes of the consultation. The meeting aimed to discuss and consider both government and indigenous perspectives on the plans. The meeting secured in-principle support of the plans, based on a number of agreed actions.

At the meeting discussions were led by a number of Torres Strait Elders who provided guidance to the meeting groups. Government agency staff and Traditional Owners all agreed that the community based approach taken by the project was successful and that all groups coming together in this way was appropriate.

As at early June 2008, the TSRA's Turtle and Dugong Project officers have completed many of the agreed actions resulting from the May meeting. An intensive planning session has recently been completed to amend plan objectives and actions and develop the first yearly work plans for the proposed ranger groups. These work plans form the basis and provide the steps needed to help establish the island based ranger programs as well as roll out initial awareness raising and program monitoring.

The TSRA LSMU project staff and project officers coordinated a series of island meetings in June and early July 2008 to finalise the plans. They involved the Traditional Owner's sign off and endorsement. The plans will be provided again to relevant stakeholders for their support.

The TSRA is also developing a funding application to the Australian government's Working on Country program. The proposal seeks to employ three full time rangers on each of the participating islands of Boigu, Badu, Mabuiag, Mer (Murray), Erub (Darnley), St Pauls Community – Moa Island, Iama (Yam) as well as across the Inner Western Islands over an initial five year period.

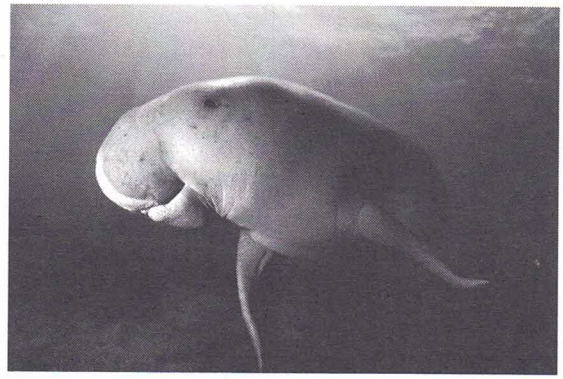
The proposal, if successful, will focus on implementing the Dugong and Turtle Management Plans and broaden the skills and capacity of the rangers, including managing a broader range of land and sea resource management activities.

Full implementation of the Dugong and Turtle Management Plans will take many years. The strong partnerships that have and continue to be formed between project officers, Torres Strait communities and government and non-government organisations will be essential for their successful implementation.

Dugong rescue and research project

Dugongs, or sea cows as they are sometimes called, are marine animals that can grow to about three metres in length and weigh as much as four hundred kilograms. They are the only marine mammals in Australia that feed exclusively on seagrass, which may be detrimentally affected by pollution, algal blooms, high boat traffic and turbid waters. The name sea cow refers to the fact that they graze on seagrass, which forms meadows in sheltered coastal waters. As dugongs feed, whole plants are uprooted and a telltale feeding trail is left behind. Dugongs play an important ecological role in coastal marine ecosystems, and the status of dugong populations in an area can be used as an indicator of general ecosystem health.

The dugong is one of four species in the order Sirenia. Remaining populations of dugong are greatly reduced, although they once inhabited all of the tropical South Pacific and Indian Oceans. They are found along the northern coastline of Australia from Shark Bay in Western Australia to Moreton Bay in south-east Queensland. The Australian population is estimated to be about one hundred thousand animals. They are currently listed as Vulnerable by the International Union for the Conservation of Nature (IUCN) and are protected by the Convention on International Trade in Endangered Species (CITES). The major threatening processes are trauma from boat strikes in populated areas, hunting by indigenous populations and diminishing food resources.



The dugong (Dugong dugong)

Moreton Bay near Brisbane is home to a significant number of dugongs. Sea World on the Gold Coast in Queensland has a long association with University of Queensland (UQ) researchers investigating population dynamics of dugongs in the waters of south-eastern Queensland. The population of approximately nine hundred and fifty dugongs in Moreton Bay has been the subject of a mark-recapture program over the past eight years. Up until now, this research has been limited to in-water sampling where the dugongs are captured by rodeo method then held at the water surface whilst the animals are tagged (using turtle tags, PIT tags and genetags), biopsied and measured. Recently, it was decided to increase the level of investigation into the dugongs of Moreton Bay to examine more comprehensively body condition, reproductive status and health. To meet these aims, dugongs were lifted out of the water on board the research vessel, RV Sea World 1, to collect accurate body weights and morphometrics, obtain blood samples for baseline health parameters and ultrasound the females for pregnancy status. During May 2008, Sea World collaborated with the dugong research team from the University of Queensland led by Dr Janet Lanyon to catch up to thirty dugongs in Moreton Bay for this unique project. The project was part of a research grant funded by the Winifred Violet Scott Foundation investigating the reproductive status and health of dugongs in south-east Queensland. The best time for sighting and then catching dugongs in Moreton Bay is on the falling tide, when animals are grazing on the shallow seagrass banks. Locations of dugong herds were plotted during an aerial survey on the day prior to the field trip. When these same herds were located by the runabout 'catch' boat on the water, dugongs were singled out in turn and then pursued and captured following a strict protocol in what is now known as 'dugong rodeo'.

This involves experienced catchers jumping from runabouts and restraining dugongs in the water, following a prescribed and controlled pursuit. Once captured, dugongs were tagged, a series of body measurements taken and faecal and skin samples obtained. The animals were then loaded onto a stretcher and towed back toward RV Sea World 1 between the two runabouts. Once back at RV Sea World 1, the animals were craned onto the deck and restrained on damp mattresses. Further body measurements were obtained to validate the in-water measurements. Blood was collected from the bundle of vessels located in the foreflipper between the radius and the ulna. Urine was collected by placing a plastic frisbee under the uro-ogenital slit of the animal as it lay on the deck. Mucus in exhaled air, vaginal swabs and tears were also collected to test for hormone levels as part of a PhD thesis being undertaken by Liz Burgess to assess reproductive status of wild dugongs. Female dugongs were given an ultrasound examination to check for pregnancy. The animals were then weighed and returned to the water. The blood that was collected will be sent for complete blood counts and multiple biochemical analyses to determine baseline parameters for normal healthy wild dugongs. Blood will also be tested for a range of trace elements and heavy metals. Serology will be undertaken to determine whether these animals have been exposed to various pathogens such as toxoplasmosis, morbillivirus and brucellosis. Blood will also be analysed for steroids including testosterone, oestrogen and progesterone and corticosteroids. In all, thirteen animals were collected over five days. Two of the adult females were confirmed pregnant by ultrasound examination indicating that the population is healthy and reproducing. Two visiting Florida manatee researchers, Bob Bonde and Cathy Beck joined the Sea World/UQ team for this fieldwork. They helped the UQ team to develop a protocol for monitoring respiration, heart rate and body temperature of wild dugongs during this out-of-water sampling venture. Sea World and UQ are also involved in a collaborative project investigating the genetic differences between the major dugong populations in south-east Queensland. This involves obtaining skin samples and faeces from a large number of dugongs and then comparing the genetic profiles of these animals within and amongst populations. This information will enable wildlife managers to make more informed decisions regarding the management of local populations based on the genetic composition of populations and the level of gene flow (movements and out-breeding) between populations.

Sea World houses the only captive dugongs in Australia – a male and a female. Both of these animals were found orphaned and stranded on the Queensland coast. They were hand-reared and are now on exhibit at Sea World. The male dugong 'Pig' was released back into the wild in 2001 but was unable to assimilate into the wild population and was recaptured some months after his release. These two dugongs are also providing baseline data for captive animals such as haematological and biochemical parameters, hormone levels and heavy metal levels. They are also providing researchers with information that is difficult to obtain from wild animals such as growth rates and onset of sexual maturity, albeit in a captive situation.

Prawn research yields big results

by David Maynard, Research Leader, Australian Maritime College's National Centre for Marine Conservation and Resource Sustainability (AMC), University of Tasmania, Launceston

A new research project by the Australian Maritime College is set to revolutionise the world's prawn fishing industry. Conducted in the Torres Strait Prawn Fishery during June, the latest round of field work saw AMC Fisheries graduates working on a prawn trawl charter.

The project received funding from the Department of Agriculture Fisheries and Forestry and the funds were used to put lights along trawl nets. The lights trigger a flight response in fish, and thirty percent of the fish are able to avoid entering the trawl net. Because these fish didn't enter the trawl, the issue of post-escape mortality doesn't exist.

The project, which uses underwater lights to deter fish from entering prawn nets, has just yielded early results that include a thirty percent reduction in fish bycatch; a ten percent increase in prawn catch; and a reduction in fuel usage meaning lower operating costs as a result of reduced weight in the net.

The project has presented a more successful picture than first anticipated. The United Nations estimates annual fish discard is 7.3 million tonnes a year. Tropical shrimp trawling is responsible for a quarter of that.

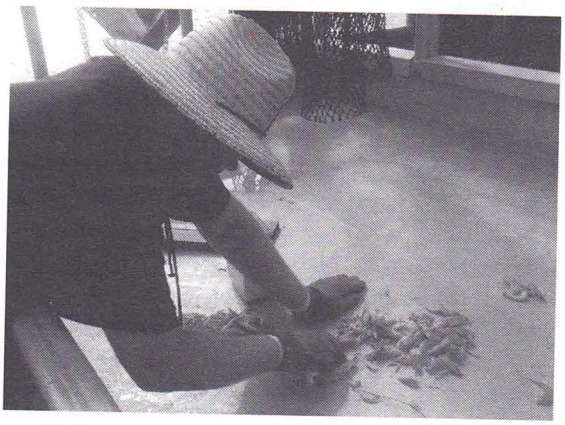
The research project has found a way to reduce discards by thirty percent. For every kilo of prawns caught there are between three and twenty kilos of fish discarded at sea. If this was adopted throughout the world massive inroads into bycatch reduction, sustainability of non-target species and sustainability of juvenile commercial species that cohabit with prawns would be made. Potentially this method could reduce global bycatch by more than half a million tonnes per year.

A new approach to an old problem has been the key. The way the research is looking at this issue is totally new. In the past the practice has been to look at ways to reduce bycatch once the fish are in the back of the net. The problem remained with the issue of post escape mortality or, put simply, what happened to fish once they escaped. All the effort in state departments, federal research organisations and overseas has gone into tackling the issue of bycatch in the back of the trawl net, thus dealing with the issue once it's happened. Overall there's about a thirty percent reduction using existing bycatch reduction tools, but we don't know if the fish that escape survive. What we don't know is the post escape mortality. The fisheries managers can feel good about these nets coming up with less fish in them but they don't know if they actually achieved anything.

The results on the lights project are still being collated but early indicators were very positive for fishers and the environment. What the early figures are showing is that as well as reducing the bycatch we're finding an increase in the prawn catch by ten percent. The decrease in bycatch means boats will have reduced fuel costs as they are trawling with less weight to tow. We also believed prawn fishermen could ultimately reduce their number of fishing days due to the catch increases.

PhD candidate Stephen McGowan attaching the lights system to a commercial prawn trawl net

A typical assemblage captured in prawn trawling. Prawns are the target species but there are ninety six species of fish living (and captured) with the prawns



Australian Maritime College graduate Chris Burns sorting bycatch from prawn trawling. This is an arduous task involving long nights of fishing and long days of sorting and measuring bycatch

Every fisherman's dream – a clean catch of tiger prawns. Fishermen are as intent on reducing bycatch as conservationists

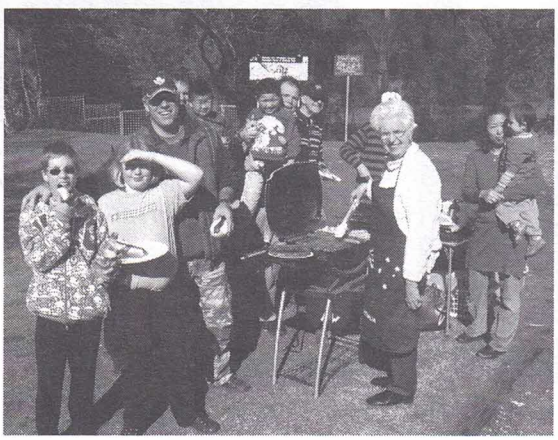
National Tree Day – a huge success

A big thank you on behalf of the Wildlife Preservation Society to all the volunteers who joined our Society to celebrate National Tree Day 2008 by planting native trees. We successfully planted out two hundred native trees around the Brighton Ponds area in Sydney to make the environment much improved for our local wildlife in all its forms.

As we wait for formal approval to further develop the site for our new ECOWORLD GARDENS project, we can take comfort in steadily planting out hundreds of native trees for our native birds and bees.

It was very pleasing to see the bright yellow flowers of the local wattle trees planted several years ago. They will add extra colour to Wattle Day, which is celebrated on 1 August each year.

National Tree Day has been a part of our regular conservation calendar for the past ten years and we have been able to encourage many people to participate in this program across Australia for the benefit of Australia's native wildlife.



Treading lightly...a sequel

by Dr Patrick Campbell

The article titled "Global warming" (Summer 08) on global warming and reducing your carbon footprint, or treading lightly, had a lot to cover! In this article I will expand on the last section.

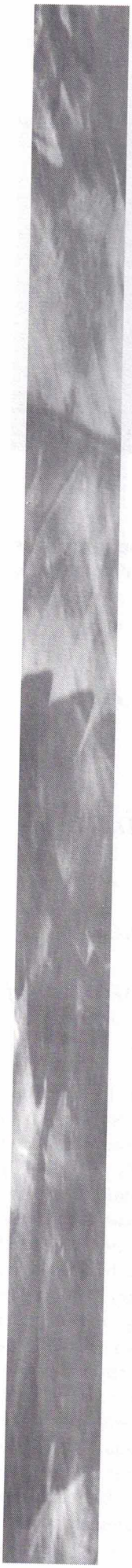
What I can do

The article advised you should "give cords a tug"- that is, pull the plug from the wall socket to ensure no power is consumed. This is not necessary (and you may end up with a damaged plug) if you can turn off an appliance from its control panel, since the cord itself consumes virtually no power. However many appliances have standby power: in this case you have to turn off the wall socket switch to cut all power consumption. For example, standby power used in the illuminated display of appliances such as microwave ovens and dishwashers is completely unnecessary - simpler and cheaper models using dials or simple switches are still available. The display power ends up as heat and this can attract cockroaches, which may also destroy the circuits. If you are installing a new kitchen, make all power points easy to reach so anything that needs to can be switched off without bother when not in use.

Apart from cutting back on consumption generally, an easy way to reduce your carbon footprint is to start getting your electricity from sources other than coal. I recommend signing up for Pure Energy or its equivalent, depending on who your supplier is (Energy Australia runs Pure Energy). These deals (beware those not belonging to the national Greenpower accreditation program) ensure your power comes from renewable resources by independent auditing. The electricity provider finds the cheapest sources so it encourages cost effective practices. Doing this will raise your power bill by up to sixty percent, depending on the fraction of your power you opt from renewable sources. You feel the pinch when you get your first bill and now have an economic as well as moral incentive to cut back, so you will instinctively find imaginative ways to do this.

When you pay for electricity, much goes into generation and transmission infrastructure, whether you are sourcing fossil or renewable energy. This equipment will largely be made using fossil or nuclear fuels, so you need to cut back consumption even if the higher power bills don't hurt.

In addition to the suggestions about cutting back on active heating or cooling, consider how to cut the flow of heat into (in summer) and from (in



winter) your spaces with methods that do not consume any energy: these practices will help to maintain comfortable temperatures. In summer, ventilation across a space is very effective. In winter, insulation - including curtains for all glass windows and doors, and blocking hot air from flowing up a stairway or into unused spaces - will help a lot.

The first appliance to get rid of, if you have one, is your electric water heater, for this will most likely be the biggest energy consumer in your house. Replace it with a solar unit if you can afford one and have the right roof aspect, and ask the installer to provide a convenient switch so you can disable the booster altogether in sunny weather. Boosters are not very intelligent, coming on as soon as the early morning rush for hot water brings down the stored temperature. Solar energy is especially effective in heating water up to a moderate temperature, so a using a booster makes more sense at the end of the day.

If you are stuck with a fairly new electric water heater, you can at least have an adjustable thermostat installed for little cost. Turn the temperature setting down from the default 70°C to about 50°C and you reduce storage losses, which are significant, by up to fifty percent - this happened for my family of three people. Storage losses are especially high with an off-peak system due to its bulk.

Next, consider getting a new fridge: this appliance is the next biggest electricity guzzler and these have recently become a lot more efficient. And ask yourself whether you can get by having a smaller size: how much cold storage do you really need? I need hardly advise getting rid of any second fridge, though if you feel you occasionally need it then just run it when you have to.

When replacing incandescent lighting with compact fluorescents, remember that the intensity typically falls by about twenty percent over the first two thousand hours, about twenty five percent of their expected life. Since this effect is not included in the rating specified, get the next higher rated equivalent. Also, if you want the familiar warm colour, go for the 3,000K type. This temperature rating describes the equivalent spectrum for a heated black body. The white types are rated at around 8,000K and may be better for reading by. The electronic ballast in the base of compact fluorescents degrades if run hot in enclosed fittings, or if used with dimmers, shortening their life.

Compact fluorescents each contain about 2.5mg of mercury and, given the number being installed, the government needs to follow the EC and set up a simple way to recycle the mercury. Coal mining releases mercury, however during a full life running on coal derived electricity a compact fluorescent's high efficiency cuts these emissions by about 4mg.

We need to do all we can to tread lightly and support all initiatives to make us pay the true cost of those commodities we consider essential.

Where I need to go with the long haul

I have recommended you start using renewable sources of electricity, which costs more than the coal-derived norm. Paying more for electricity is really coming to terms with reality, since those who presently consume coal do not pay for its environmental costs. The artificially low price of coal leads to unfair competition for renewables and this market distortion limits the speedy uptake of renewable energy to a trickle in Australia. Elsewhere, such as in Germany, the inevitable need for change has been accepted and investment is encouraged, with very favourable rates for renewable power delivered to the grid. Unlike here, energy retailers are obliged to buy this renewable power from households - currently at three times the selling rate.

In Australia, the coal industry benefits from enormous subsidies, far more than renewables receive for development of any kind. This is an avoidable market distortion. The coal industry's efforts to avoid paying for carbon trading permits when these are introduced are a sign that it really does not get the big picture. Parallels here with the tobacco industry...

Clean coal? In your dreams. Tim Flannery wrote in the *Sydney Morning Herald* recently that carbon sequestration should be taken seriously. He should stick to the fields he knows something about. A feature article by Fred Pearce in *New Scientist* concluded that carbon sequestration will never collect more than two thirds of emissions from burning fossil fuels. Following the article a letter pointed out that this would only really reduce total emissions from coal by between five to ten percent since most are released during the mining process. Coal mining is usually open-cut these days and its emissions are not accessible to capture. Another reason not to rely on sequestration is that its implementation by the world's thousands of coal fired power stations would take decades, and this will be too long to wait.

A nuclear future? Forget it: according to an article by an ex-environment minister under Blair in the *Guardian Weekly*, much nuclear fuel

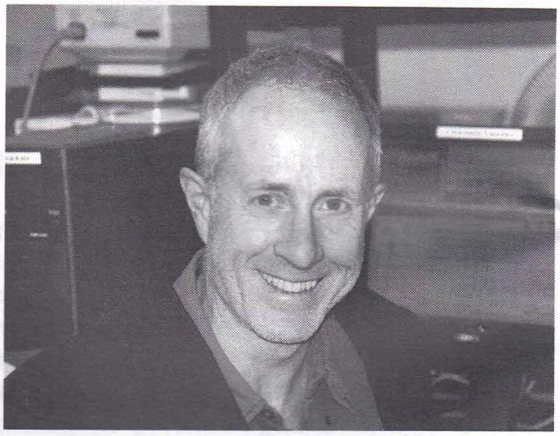
presently comes from decommissioned Russian weapons. When this source runs out, there will be a shortage because mining of this resource reached its peak in the 1970s, probably because of the demand at that time for nuclear weapons. Only lower grade uranium will be left and this will require heavier fuel use, much of it fossil derived, so this industry will have a limited future. And reprocessing, which allows for more efficient use of uranium fuel, is, for good reasons, extremely unpopular.

Is treading lightly all we *need* to do? Clive Hamilton of the Australia Institute points out that "...The assignment of individual responsibility is consistent with the economic rationalist view of the world, which wants everything left to the market, even when the market manifestly fails." Face it, many people have other priorities. Notwithstanding, we choose to tread lightly because it seems all we can do.

It is pretty clear that our government has enormous challenges in dealing with climate change. The carbon lobby continues to frustrate the effectiveness of carbon trading policies. Great determination will be needed in facing up to those with vested interests in energy intensive industries, for it is they who presently, if unsustainably, enrich the economy and provide more jobs. But it is getting too late for delay tactics. We need an independent body to help us do this, independent of party politics. Professor Ross Garnaut said in his recent report to the Rudd government that "climate change is a diabolical policy problem" and commentators have agreed. Setting emission caps will be difficult – look at the recent fuss over petrol prices. An independent body could set caps and prices, much as the Reserve Bank sets interest rates. It is beyond politics. The key will be to divert investment into riskier forms, away from the easy path, to encourage us, particularly our young, to see a future in these new areas.

Figures from economists Nicholas Stern (UK) and Garnault suggest that full implementation of carbon taxing will only marginally slow economic growth in each respective country. However George Monbiot, author of *Heat*, has moved beyond this mindset, writing in *The Guardian Weekly* that the issue is not so much to cut our consumption but to arrest the continued growth of the world economy: over each period taken for it to double in size, it consumes the total of resources used in all previous times. Frightening.

Economic growth is driven by desire for the "good life". Be aware of the general rule that the price you pay for most things is a guide to the embodied energy, or carbon footprint, of your purchase. Ultimately, and perhaps unpalatably, cutting down on things, and especially expensive things, is the right way to lower your footprint.



Dr Patrick Campbell

Editor's note: Dr Patrick Campbell works in the area of photovoltaic, or solar cell, research.

University Grant winners 2008

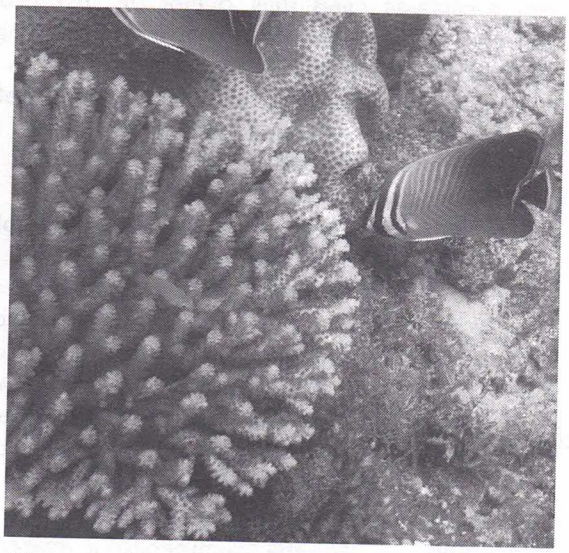
The control of coral disease by coral-feeding fish

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

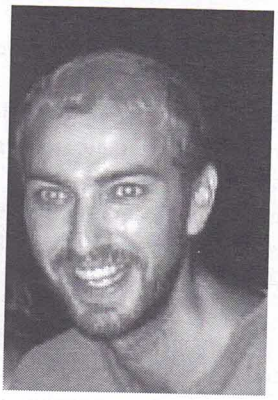
The world-heritage listed Great Barrier Reef (GBR) is the largest continuous reef system in the world, home to millions of reef-associated species that depend either directly or indirectly on hard corals for survival. Traditionally, rates of coral disease on the GBR have been low, however within the last decade the number of reefs suffering from coral disease has increased substantially. Coral disease differs from acute stresses such as coral bleaching or outbreaks of crown-of-thorns starfish, which give the coral community a chance to recover between subsequent disturbances. 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. However, with the help of the Wildlife Preservation Society of Australia, my PhD research is examining the potential benefits of coral-feeding fishes (corallivores), which may be an important biological control of these diseases.

Most coral diseases follow a similar pattern of a distinctively coloured band that marks the interface between healthy and necrotic coral tissue. This band of infection progresses through the coral colony, completely destroying the coral tissue. Any predation upon this infectious band by coral-feeding fishes is expected to result in reduced virility of the infecting agent, making recovery more likely for coral colonies. If coral-feeding butterflyfishes are important in limiting disease transmission, then it is expected that managing and conserving populations of coral-feeding fishes in the Great Barrier Reef and Southeast Asia Pacific region will enable effective biological control of these devastating diseases. This will also enable future reef restoration projects to have the greatest chance at success.



Chaetodon Baronessa feeding on coral colonies



Andrew Cole

Andy Cole working in Aquarium complex, Lizard Island

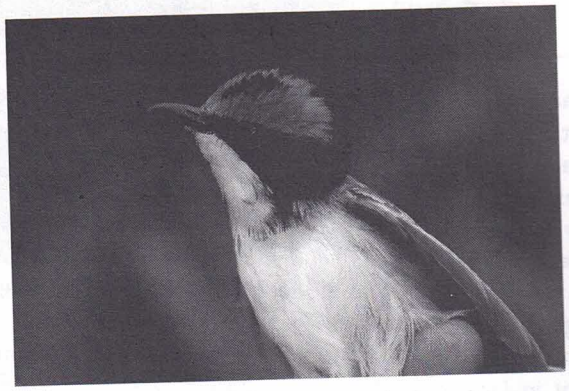
Phylogeography and conservation biology of the purple-crowned fairy-wren (Malurus coronatus)

by Anja Skroblin, School of Botany and Zoology, Australian National University

The purple-crowned fairy-wren is a small co-operatively breeding bird that is restricted to vegetation that occurs as discreet patches along the rivers of Northern Australia. The species' natural history renders it susceptible to degradation of its riparian habitat as it lives in small family groups, maintains stable territories over several years and possesses limited dispersal capabilities. Changes in contemporary fire patterns, physical damage by stock and introduction of weeds have degraded and further fragmented purple-crowned fairy-wren habitat to varying degrees across its range. The western subspecies *Malurus coronatus coronatus* has been most affected, declining in both range and density. It is currently listed as Vulnerable under the *Federal Environment Protection and Biodiversity Conservation Act 1999.*

This project aims to inform conservation of the purple-crowned fairy-wren and use the species as a model system to address the conservation issues of species that inhabit naturally fragmented habitat. For conservation, we need to understand how species persist across a series of discrete habitat patches and how they respond to increased levels of degradation and habitat fragmentation. This project will gather data on the distribution, abundance and phylogeography of the purple-crowned fairy-wren, as well as the spatial structure of its habitat. It will examine the relationship between patch occupancy, dispersal behaviour, population genetics, pattern of habitat patches at a landscape scale and the effect of habitat loss and degradation on population dynamics. This data will be used to predict implications of current land management

practices and to make recommendations for effective conservation of riparian specialists, including the purple-crowned fairy-wren, and other patchily distributed species.



Male purple-crowned fairy-wren in breeding plumage

Anja Skroblin

Persistence of endangered species: Is the dingo the key?

by Arian Wallach, School of Earth and Environmental Sciences, University of Adelaide

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" Aldo Leopold

Despite the relatively low human population density in Australia, almost half of all mammalian extinctions worldwide in the past two hundred years have occurred in Australia. The severity of biodiversity loss has been directly attributed to the introduction and spread of invasive species such as foxes, cats and rabbits. Wildlife managers and conservation agencies in Australia have reacted to this crisis by directing most of their efforts and resources into pest control operations. Pest control includes: warren fumigation and destruction (ripping and blasting), shooting, trapping, spread of disease (eg calicivirus), surgical sterilization, immunocontraception, and most commonly 1080 poison baiting. This approach has not provided a long term solution, and we believe that it has in fact exacerbated the problem.

The commonly held view that controlling invasives will necessarily benefit biodiversity and productivity is overly simplistic. There has been an extensive international debate regarding the validity of population control for conservation purposes. In Australia, however, the possibility that control operations may be having a negative impact on native species and productivity has been largely overlooked. There is a prevalent tendency to "shoot first and ask questions later" when endangered species are at risk, but caution is warranted because poison baiting may be a double edged sword. Although the reduction in predators can cause an increase in prey, the ecological processes that maintain ecosystem functioning and biodiversity may be lost. In Australia conservation efforts are mainly directed at intensive pest control and reintroduction programs of endangered species. Both action focus on the weaknesses in the ecosystem and thus cannot be sustainable solutions. It is unknown, in fact, how long a pest-control dependant system can function. But what we do know is that once this course of action is chosen the need for intensive human intervention only increases.

We believe that nature is capable of rehabilitating itself and adapting to change provided that it is regulated by a large predator (top-down regulation). Australia's top predator is the dingo. We propose a new working model for ecological restoration that focuses on supporting the inherent strengths of ecosystems. At the base of this model are four guiding principles:

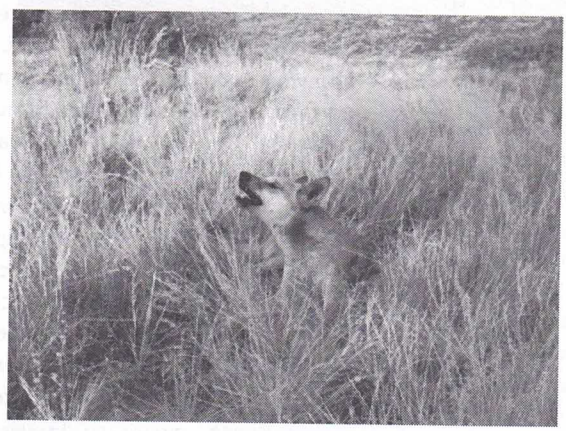
1. Overabundance, extinction and invasion are the symptoms of a weakend ecosystem, and symptoms should not be treated
2. Restoration must always begin with the top predator (dingo) and work its way down through the food web
3. Once top-down regulation is functioning reintroduction programs should focus on species that provide ecological robustness and resilience such as keystone species and ecological engineers
4. Species of high endangered status (critically endangered and endangered) are reintroduced at the very last stage.

Since European occupation, dingoes have been targeted for lethal control over much of the continent, most commonly with 1080 poison baiting. The pastoral industry regards the dingo as a threat to livestock, particularly

sheep production. Conservation agencies also afford dingoes little or no protection and often actively control them to reduce their impact on neighbouring pastoral stations. Some scientists and government departments consider the dingo a threat to native wildlife and an introduced pest. In fact, during a continuous nine month field trip across South Australia we failed to find a single place larger than five hundred square kilometres that has permanent water where dingoes have not been persecuted for more than four years. The dingo may in fact be one of the most highly persecuted species in the world. Considering their complex social behaviour and the ethical implications of such widespread persecution, and the potential key role of dingoes in biodiversity conservation, wildlife management is in clear need of fundamental rethinking.

Two experimental designs are applied to test our proposed model for ecological restoration. The first design monitors the ecological changes following the cessation of poison baiting and rehabilitation of dingo populations. The second design is a continent wide survey testing whether there is a correlation between threatened species survival and dingo population abundance and stability. The results of our study are indicating that ecosystem health and biodiversity depends on the integrity of dingo populations. One year following the cessation of poison baiting, dingoes increased in abundance and started to form new packs, foxes remained stable, cats and rabbits decreased, and small native mammals increased. All threatened species surveyed were found to be living in association with dingoes, even in sheep grazing areas deep inside the dog fence, where dingoes were believed absent for several decades. The results of this research, together with other published studies, indicate that the key to ecological restoration is Australia's native wolf.

We thank the Wildlife Preservation Society of Australia for ongoing support.



The dingo (Canis lupus dingo)

Arian Wallach

Insect pollinators in natural and agricultural ecosystems

by Romina Rader – School of Marine and Tropical Biology, James Cook University, Cairns

This study examines insect pollinator assemblages in four different land uses (dairy, orchard, cropping and remnant forest) with the aim of determining the impact of land use on biodiversity and the fundamental ecosystem service of pollination. The project consists of collecting monthly samples of insect orders visiting crop flowers over a twelve month period on the Atherton Tablelands, Queensland and the Canterbury Plains, New Zealand. The first component of this project investigates insect pollinators on cropping farms to determine if insect orders/ families differ in the amount of pollen they carry and if these differences are related to physical features of the insects, namely body surface area and hairiness. Insects were hand captured with a net over a twenty one day period, and then taken back to the laboratory for processing. For each insect collected, body surface area, hairiness and the amount of pollen carried will be measured. Lab work is still in progress to process all samples. Preliminary results suggest that insects other than the honeybee are capable of carrying large quantities of pollen yet it is not yet clear if the amount carried is related to their body size or hairiness. The outcomes of this study will enable a detailed understanding of the role native insects play in providing pollination services to agricultural systems.

Romina Rader

Romina Rader in the field

Mitigating the effects of habitat fragmentation: Understanding dispersal patterns for improved conservation of forest birds

by Danielle Shanahan, Spatial Ecology Lab and CSIRO Sustainable Ecosystems, University of Queensland

Habitat loss and fragmentation are causing devastating species declines and extinctions worldwide. In South East Queensland this is a particularly pressing issue given the human population in the region is set to increase by almost two-fold in the next twenty years. As the human population continues to grow so does the demand for housing and infrastructure - this poses a serious threat to the persistence of wildlife populations.

To effectively mitigate this threat we need to understand basic population processes such as dispersal and migration that are negatively affected by landscape change. However, due to limitations of techniques available in the past, little real data is available on these processes. New and developing genetic techniques could be used to bridge this knowledge gap. These techniques could allow the researcher to investigate the overall relatedness between individuals, providing significant power when investigating the effects of landscape change.

Within my study I am testing the effects of habitat fragmentation on two bird species, the yellow throated scrubwren (a rainforest specialist), and the white-browed scrubwren (a generalist species that survives well in disturbed areas). I hope this research will not only reveal important patterns that can help guide landscape planning, but will also help test and develop individual based genetics techniques on bird species: something that has not been done before. Successful application of these techniques will afford researchers the opportunity to not only understand the effects of landscape change in much finer detail, but also potentially avert the effects of habitat fragmentation with greater confidence.

Yellow throated scrubwren

Danielle Shanahan

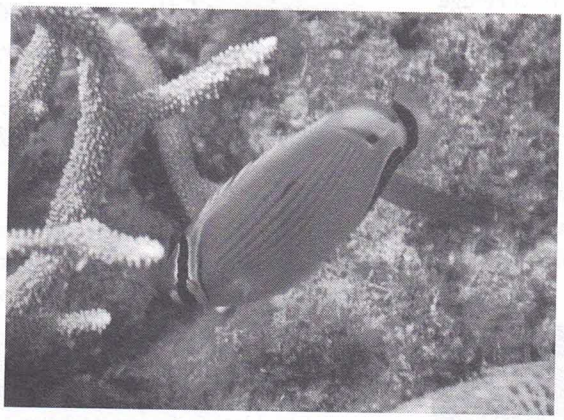
Ecological specialisation and susceptibility to disturbance in coral feeding butterflyfishes

by Rebecca Lawton, ARC Centre of Excellen James Cook University

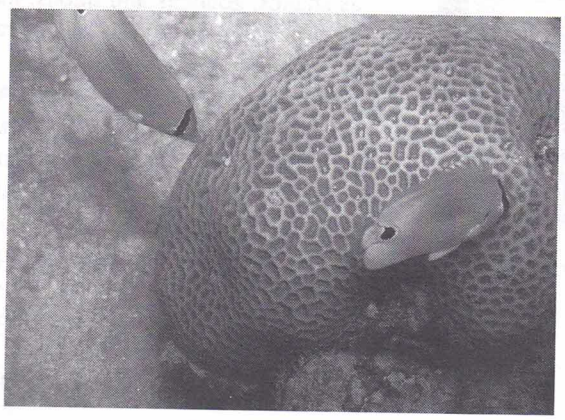
The frequency and intensity of disturba on coral reefs, such as climate-induced bleaching, terrestrial run off, disease, outbreaks of crown of thorns starfish increasing so that coral reefs are now threa on a global scale. Worldwide, coral reef showing long term declines in coral div coral cover and associated habitat structur evidence is now mounting that these de are having significant negative impacts on associated fishes. So far, these impacts have greatest on those fishes that depend on liv for food or shelter. As the frequency, in and magnitude of climate associated distu events on coral reefs are projected to in many such fishes may be at considerable extinction. Establishing the factors that in species' susceptibility to disturbance is th critical in prioritising conservation efforts at preventing ongoing species losses.

Coral-feeding butterflyfishes are consistently among the worst-affected fishes following coral loss. My research will assess the extinction risk of this group of fishes. I will examine the capacity of coral-feeding butterflyfishes to withstand large-scale disturbances through geographic variation in ecological versatility, and/or recolonisation of disturbed habitats by remnant populations. I want to test whether highly specialised butterflyfishes require similar resources throughout their geographic range. If so, this shows that ecological specialisation is a highly conserved attribute that greatly increases vulnerability to global extinction in such species. I will also quantify population connectivity among geographically separated populations of butterflyfishes using genetic markers to examine the potential for re-population of reefs via long-distance dispersal.

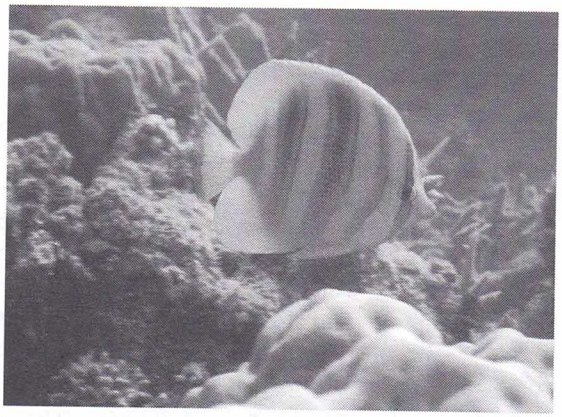
Rebecca Lawton



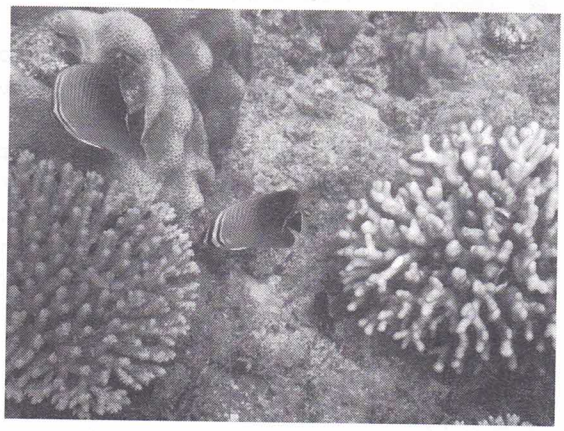
Redfin butterflyfish (Chaetodon lunulatus)



Blue-spot butterflyfish (Chaetodon plebius)



Rainfords butterflyfish (Chaetodon rainfordi)



Eastern triangular butterflyfish (Chaetodon baronessa)

Factors influencing feeding behaviour of the black-winged stilt (Himantopus himantopus) in coastal soft-sediment lagoons

by Katherine Forsythe, Centre for Research on Ecological Impacts of Coastal Cities, University of Sydney

Shorebirds and the wetlands habitats in which they live and feed are under threat globally. Although this species is not currently threatened, black-winged stilts (*Himantopus himantopus*) in eastern Australia have been estimated to have declined in numbers by eighty percent over the past twenty four years. With increasing numbers of shorebirds utilising man-made and/or managed wetlands, understanding what factors influence feeding behaviour is important if the managers wish to provide feeding habitats in order to conserve black-winged stilts and other shorebirds.

Due to their extremely long legs they can feed in a variety of water depths that are not accessible to many other shorebirds. The black-winged stilt displays great plasticity in terms of how they feed, what they feed on and where they feed, making

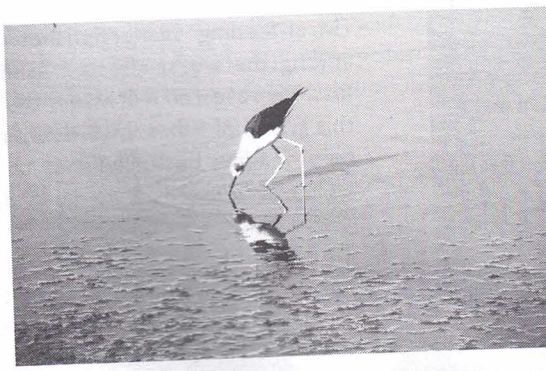
them an ideal species to study factors influencing different feeding behaviours.

Initial testing indicated that the proportion of pecks at the surface of the water and pecks below the surface of the water differs for when stilts feed in shallow and in deep water. This pattern was seen in a population at the waterbird refuge at Sydney Olympic Park water bird refuge and also at Kooragang Wetlands near Newcastle. This pattern of behaviour could be a result of a factor that is different between water-depths, or different between areas within the water bird refuge. A tidal gate at the water bird refuge allowed the water level inside the lagoon to be increased and decreased. This is the first large scale manipulative experiment to relating foraging behaviour of a shorebird to water depth.

The results indicated that stilts pecking in original "shallow" areas responded to increases in water level (making them like "deep" areas) by behaving in a similar way to those in original "deep" areas. Black-winged stilts pecking in "deep" areas, however, did not respond to decreased water level (making them like "shallow" areas) by behaving in a similar way to stilts in originally "shallow" areas or original "deep" areas. So it seems that stilts in "shallow" areas are responding to some factor of the water depth rather than the area of the water bird refuge, where as stilts in "deep" areas are not responding to either the water depth or the area of the water bird refuge alone.

Stilts foraging in "shallow" areas may be responding to differences in potential prey or changes in physical characteristics that alter with water-depth. Experiments are currently being conducted to establish if there is any link between water depth and prey and/or turbidity.

Katherine Forsythe, observing black-winged stilts foraging

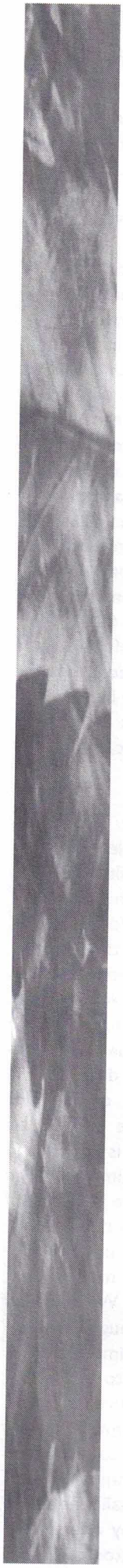


Black-winged stilts foraging in (a) shallow wate and in (b) deep water

Conservation of native bird populations in a changing environment: does the continuin invasion of the cane toad pose a risk to avian biodiversity in Australia?

by Christa Beckmann, School of Biological Sciences, University of Sydney

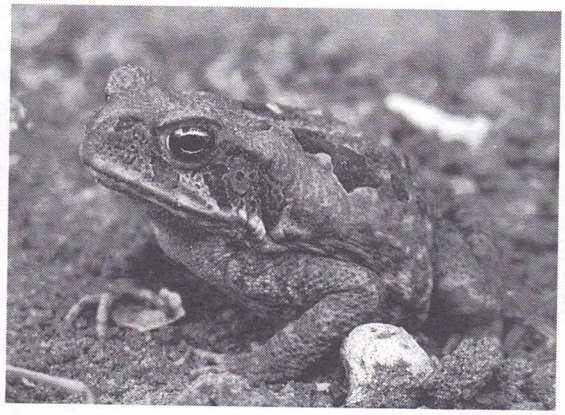
Invasive species can lead to dramatic native spe loss and ecosystem change. The cane toad (*marinus*) is one of the world's most infan invasive species. Introduced in 1935, the h toxic cane toad now occupies more than million square kilometres of Australia. The toad has been shown to have adversely affe populations of native Australian predators as snakes, goannas and quolls, many of whic after consuming toads. In contrast, the pot toxic effects of cane toads on predatory have been largely ignored. A few anec reports suggest than some native birds prey cane toads with no adverse effects, and that birds have learned how to handle toads that they do not come in contact with the glands. However, rigorous quantitative are lacking, and the questions of whether toads seriously affect populations of native or if birds have the potential to contro populations, have not been studied.



My project seeks to increase our knowledge of the impacts of the invasive cane toad on native Australian birds. I have identified 173 frog-eating bird species that are currently sympatric with cane toads in Australia. These birds therefore may also consume cane toads (as they have similar body shapes to native frogs). Interactions between cane toads and birds have been reported for twenty five bird species. Of these, six species were reported to have died after consuming toads. Cane toads may become an important food resource to birds capable of dealing with their toxins. Some wading bird species (such as cattle egrets) that forage in wetlands have been documented to consume toad metamorphs. Because these large birds have the potential to consume large numbers of toads, avian predation may play a significant role in controlling toad populations. The objectives of my research are: a) to determine if native birds play a significant role in consuming toads (as anecdotal reports suggest); and b) to clarify the impacts of cane toad invasion on bird populations.

My research will help to identify bird species that may be at risk from toad presence, a critical concern for management plans in areas where the cane toad has become established or will soon invade. Recent analyses suggest that toads ultimately will spread to broad areas of southwestern Australia as well as the tropics; so many bird species are involved.

Christa Beckmann



Cane toad (Bufo marinus)

Cane toad metamorph

The role of cracking clays in maintaining rangeland biodiversity

by Helen P Waudby, School of Natural and Built Environments, University of South Australia

Cracking clay soils in the South Australian rangelands may provide refuge for small mammals and reptiles, invertebrates, and plants and seeds. Previous studies suggest that cracking clay soils are probably important habitat for small arid zone dasyurids such as planigales (*Planigale spp.*) (Read 1987). Additionally, cracking clays may represent critical habitat for nationally threatened species such as the plains rat (*Pseudomys australis*) (Brandle and Moseby 1999; Brandle et al. 1999). Research on the habitat qualities of cracking clays has been limited and although their importance for small mammals has been examined to a limited extent, it appears that no research has been undertaken for small reptiles. Similarly, information on the role of cracking clays in maintaining seed viability and vegetation establishment is limited. Because of their likely habitat values, cracking clays probably play a role in maintaining rangeland biodiversity.

Australian arid and semi-arid zones (the rangelands) constitute over seventy percent of the continent (Smyth and James 2004). Rangeland biodiversity faces a number of presssures, including grazing. Pastoralism is the primary commerical land use in the rangelands (Smyth and James 2004); this land use may degrade cracking clay habitats. Quantifying the biodiversity value of cracking clays will enable the development of management recommendations for cracking clay landscapes affected by grazing.

Formal studies have not focused on the sheltering properties or habitat values of cracking clays; their habitat value is generally suggested rather than quantified. If cracking clays are important

for maintaining biodiversity, then this role should be considered in relation to the impacts of key land uses. We suggest that cracking clays act as sources of biodiversity in arid landscapes. Research to determine the nature of this role, including the characteristics of cracking clays, their shelter qualities, role as habitat for small animals, and role in food provision and seed/seedling protection is warranted.

We will examine the shelter properties of cracks, including their role in temperature and humidity control, study the effect of grazing on cracks, determine the role of cracking clay soils in the arid zone food web, elucidate how cracking clays are used spatially and temporally by small arid zone animals, and develop recommendations that can be used by various agencies to manage areas characterised by cracking clay soils. Our research will have applications for natural resource management and conservation in the arid zone, and will be relevant for natural resource management boards, the Department for Environment and Heritage, managers of pastoral properties, and the mining industry. Much of this research will be undertaken at remote locations in arid South Australia. The costs of travellling to and working in remote areas are substantial. Funding provided by the Wildlife Preservation Society of Australia will allow us to cover some of these costs.

Helen Waudby

Crackling clay field

The influence of biological oceanography on coral reef biodiversity

by Alex S J Wyatt, School of Environmental Systems Engineering, University of Western Australia

Coral reefs are hotspots of biodiversity and provide a large range of ecosystem goods and services. Although we know that coral reefs are under increasing pressure from climate change, acidification, habitat destruction and over-fishing, factors controlling their productivity and function at an ecosystem level are still poorly understood. Based on the early work of Darwin, coral reefs were long thought of as 'closed' ecosystems independent of the surrounding ocean. More recently, studies have begun to suggest that reefs may be closely linked to the ocean, and perhaps more dependent on its variability, than previously considered. Our recent work at Ningaloo Reef, Western Australia has indicated that the reef may depend on an area of ocean on the order of ten thousand square kilometres, from which it sources nutrients in the form of plankton food. Such broad-scale linkage between reefs and oceanography has several significant implications for the conservation of coral reefs in the face of accelerating human and climatically-induced change.

Due to links to oceanographic processes reefs may be even more susceptible to human activities and global changes that alter regional oceanography than previously thought. The dependence of reefs on planktonic food sources from large areas of oceans increases the potential scale of impact from human activities such as dredging and drilling for oil and gas. At Ningaloo oil and gas developments are being approved increasingly close to the reef. Quantifying the area of ocean upon which a reef depends will allow more effective management of activities within this area so as to minimise impacts on a reef. At a more global level, it is recognised that the direct effects of global climate change and ocean acidification may lead to the loss of coral-dominated ecosystems within this century. The role that indirect effects, such as changes in offshore currents and productivity, may play has not previously been considered. While corals themselves have often been thought one of the most sensitive indicators of climate change, planktonic communities are likely to be equally, if not more, sensitive to global change, especially given their short life cycles. Climate change and acidification has the potential to alter both the composition of planktonic communities and, perhaps more importantly, their quality as a food source for coral reef organisms by altering the ratio of carbon to nitrogen in plankton cells.

potential indirect effects of climate change and ocean acidification on reef systems are not well understood in comparison to the well published direct effects. Better understanding of the future of coral reefs under various development and climate change scenarios requires quantification of the links between reef organism and planktonic communities.

A pilot experiment to be undertaken in November this year aims to identify which components of the coral reef food web play a significant role in the incorporation of plankton from the ocean, and therefore their susceptibility to oceanographic changes. We will develop methods which will allows us to map the reef food web, including plankton uptake from the surrounding ocean, and thereby identify processes linking the ocean and reef ecosystems. By providing a mechanic understanding of reef-ocean linkages, and the susceptibility of reef ecosystems to oceanographic changes, the study will be invaluable for guiding reef management and conservation globally. Thank you to the Wildlife Preservation Society and CSIRO Wealth from Oceans flagship for providing the funding to make the experiment possible.

Alex Wyatt

Wildside

by Marny Bonner, Australian Seabird rescue

Left, right and centre

Eighty seven percent of humans are right-handed. In parrots, however, it's the other way around.

Human brain researchers reckon that left-handed people are better able to multi-task. Parrots multi-task. They can do several things at once: balance on one leg, grasp a large seed or nut with the other foot, and hold it up while cracking it open with their beak. Over seventy five percent of parrots use their left foot for holding food.

Cassie the galah. Cassie was given to Lance Ferris to look after while her owner, Irene Callahan of Sydney Wildlife, went overseas for year. She came to Irene some thirteen years a when Sydney Wildlife was called because Cass was found wandering down a street somewher in the suburbs - obviously a lost pet. All attem to rehabilitate her back to the wild were abject failures; she even rejected galah company. Wh Irene put us up prior to conducting a worksho for Sydney Wildlife, Cassie fell in love with La and Irene had never seen her take to anyone like she did to him. When Irene returned from overseas, Lance was pretty attached to Cassie - especially so after I left the centre - and Iren decided to leave her with him. Rochelle has inherited her and she is never short of compan attention and someone to 'groom' her. She has inspired me to write a children's book, "The bi who was afraid to fall".... one of these days!

Ethology, the scientific study of animal behavio is full of fascinating facts like this. Wh most wildlife research focuses on saving spec ethnologists just want to study the quirky st They have discovered that walruses are a "right-handed". Walruses love shellfish. Wh searching for bivalves burrowed in the sea flo they swish away sediment by beating a flipp always their right flipper.

Concerned that their sample size was t small, the researchers then turned to muse specimens. They're not quite so dangerous. the twenty three skeletons measured, all show a similar pattern of right flipper preference – right limb bones were longer than the left.

Compare your thumbs. If you are right-hand your right thumb is usually longer and vice ve for left-handedness.

Turning to other marine mammals, one stu of humpback whales found that seventy sev percent use their right flipper to slap the wa surface during behavioural displays. Of c closest relatives, however, most are left-hand Despite that, apes and monkeys always use th left arms to cradle infants regardless of whetl they are left or right handed, just as humans d

Other studies have also revealed that chickens generally use their right eye for seeking out seed and several toad species prefer their right foot for wiping their faces.

Whether left or right-handed, footed or flippered, it seems that specialisation of one side of the brain for certain tasks developed very early in the evolution of vertebrates.

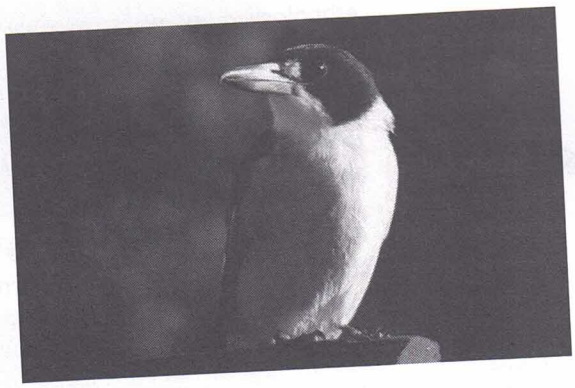
Hop step or run

As they raced each other for the grub the butcherbird was a bounding blur and the magpie was power walking, but why do some birds hop and others walk?

It's all about conserving energy while maximising speed. Smaller birds with shorter legs generally hop. They can cover more ground by hopping than with tiny steps and because they're light it's not a big effort. Bigger birds walk because for them the distance covered in either a hop or step is about the same but walking uses less energy. The aquatic environment creates exceptions: all wading birds walk regardless of their size.

Urgency changes everything. With the help of wings, a hopper in a hurry can lurch into a leap and a walker can rush into a run.

As for the race between the butcherbird and the magpie, the hopper won. It was more about aggression than ambulation, but that's another story.



Butcherbird

Magpie

Fork mightier than the sword

Food shopping used to be simple and was reflected in the size of our rubbish bins. Remember how a week's rubbish generated by an average family fitted into small tin bins with ill-fitting lids? There was no plastic wrapping, kitchen scraps went to the chooks or compost, leftovers went to pets and newspaper was burned in the backyard incinerator.

These days food shopping has environmental implications far beyond too much packaging and the benefits of regional produce. Our supermarket shelves are crammed with food products delivered to us from around the world, all depending on a steady supply of cheap fossi fuels. Being a conscientious shopper has now even surpassed the choices between artificia and natural, Australian versus imported and lov fat, gluten free, low GI options. Now it is also about 'carbon footprints' and whether or not w purchase a food product that is really owned b an American cigarette company. There are som things the labels neglect to tell us.

But this is a column about wildlife, not food. S what does grocery shopping have to do wi wildlife?

Whilst we would never personally harm a w creature deliberately, individual choices at t supermarket can have a collective impact that very deliberate. Those little tins of tasty tuna a so handy but would you sit down to an albatr sandwich, sea turtle salad or dolphin patt These are just a few of the "by-catch" creatu that lose their lives through long-line fishing tuna netting that is not dolphin-safe.

Food facts

- The pet food industry now consu more fish than all the seals in the w even though fish is not the natural di cats and dogs
- Penguin numbers are plummeting du lack of food caused by overfishing
- Most Australian prawn trawlers are with turtle exclusion devices, s hundreds of turtles from drowni their nets. Imported prawns have no guarantee
- The demand for palm oil plant is driving many rainforest anima extinction, not only orangutans bu the Asian elephant and Sumatran rhino and clouded leopard to name

Demand and supply

If a product listed whale oil as an ingredient it would never sell. Yester-year's whale oil is today's palm oil. It is used in a wide variety of products such as crackers, crisps, popcorn, margarine, biscuits, soap and shampoo (see www.palmoilaction.org.au).

Throughout south-east Asia and Africa, millions of hectares of rainforest and their wild inhabitants are destroyed irreversibly every year to make way for palm oil plantations. In Indonesia alone an area of forest equal to three hundred soccer fields is being destroyed every hour. Australians consume an average of ten kilograms of palm oil per person per year, seemingly unaware of the consequences.

Our shopping habits directly affect the laws of supply and demand. Something as obvious as whale meat would be boycotted by most Australians. Something as obvious as palm oil should be also, if only product labels were truthful. Some manufacturers, detecting the increasing aversion to palm oil by conscientious consumers, are concealing the truth by calling it vegetable oil.

Just as animal testing and whale by-products have become entirely unacceptable to society, manufacturers can and do find other ways of making these products. As consumers we can and must find ways of reducing demand since we cannot find other ways of making orangutans.

Safe havens save frogs

In the colder weather, most frogs and fellow amphibians do their best to fend off the cold. Garden mulch, hollow logs and frog-friendly foliage such as bromeliads and birds nest ferns are favourite hideouts. In their secret solitude most frog species will be dormant until spring.

There are forty five species known to inhabit the far north coast of NSW, every one an important link in our ecosystem and all declining in numbers. Although winter seems like a good time to clean up gardens, putting it off for a few months will provide them with protection for the colder months. Leaving some safe havens from birds and other predators all year round will give them protection for life.

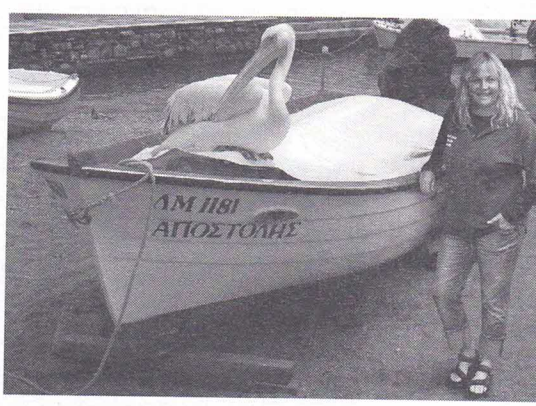
In the USA there is one frog species that has found the ultimate safe haven. The Texan tarantula digs a burrow to lay its eggs and is known to share its lair with the tiny frog. It's a two way deal. The tarantula lets the frog nestle in its hairy legs while the frog eats ants and other insects in search of spider eggs. Performance reviews must nerve-wracking since tarantulas have been kno to eat very small frogs.

Green tree frog

Keeping pace

Although wildlife rescues generally decrea during the quieter winter months, the impact ocean pollution and recreational fishing on coas birds and marine wildlife continues. On the NS far north coast, Australian Seabird Rescue (AS has been busy with eight sea turtles ranging size from five to eighty five centimetres, whi their south coast team tries to keep pace wi the worst rate of pelican injuries in the country

Wollongong resident Julie Clarke heads up th team that monitors two hundred kilometres coast south to Batemans Bay.



Julie Clarke with pelican

A 2001 survey by the federal Department o Agriculture, Forestry and Fisheries found tha there were some 74,000 recreational fishers i the Illawarra district alone. Weekends and schoo holidays are an explosion of pelican rescues.

ASR Wollongong recently rescued six pelicans in just four days - all were hooked, entangled o otherwise injured by fishing tackle.

The total number of pelicans rescued by the team since it was established in October 2005 now exceeds three hundred and twenty, an average o

ten per month. Although the group has worked hard to raise awareness in the community, many of the fishers are migrants whose first language is not English. Julie now plans to distribute educational brochures in multiple languages.

On the far north coast the injury rate of pelicans dropped by ninety two percent thanks to ASR's awareness raising campaigns. We hope that we can have the same success in the Illawarra district.

Stalking storks

Toucans and tapioca have something in common; both words come from the South American Tupi Indian language. Another Tupi word is 'jabiru', a case in point regarding scientific names of animals.

The jabiru (*Jabiru mycteria*) is the largest flying bird of Central and South America. It is not the same as Australasia's so-called jabiru, (*Ephippiorhynchus asiaticus*) whose correct name is the black-necked stork, the only stork species in Australia. It is likely to be separated from the Asian black-necked storks in the future and will be known as the satin stork.

The stately storks are very shy and there are less than eighty breeding pairs in NSW. They prefer warm weather and do not venture further south than Sydney. I was delighted to see three in one day, all within cooee of Casino, when I accompanied Greg Clancy on a routine field trip.

Greg Clancy

There's not much about black-necked storks that Greg Clancy doesn't know. Soon after he moved to Coutts Crossing near Grafton twenty three years ago, he saw one and was fascinated. Discovering that they were a threatened species, Greg was compelled to learn about their habits, breeding biology and threats to their survival. He spread the word for people to let him know when and where they saw any storks and began to join the dots.

"In the past five years alone I've driven over 60,000 kilometres and met a lot of farmers," Greg said. "From all the information gathered we now understand that storks aren't nomadic or migratory as first thought; they just have a huge territorial range of about ten thousand hectares."

Greg has also discovered that storks mate for life but will re-mate if they lose their partner. Although they sometimes feed alone, they maintain a bond and roost together on the ground. Main threats to their survival are loss of wetlands and power lines. It should be easy to see a big bulky black and white bird that is 1.3 metres tall, half of which is bright red legs, but they are surprisingly well camouflaged when in grasslands or a tree. You can't listen for them either since they have no voice box. Their usual means of audible communication is to clatter their beak.

Black-necked stork

Binoculars reveal a glorious green and blue sheen on the stork's black head and neck. There is little difference between sexes except that the males are slightly larger and have dark eyes while the females have yellow irises. They look like a black headed pelican on stilts but every movement of this peacock-proud bird is graceful and precise. In less than an hour at one wetland we saw a male stork catch three eels and a fish. Greg was not surprised as he's seen a stork regurgitate eight eels in one go for its young to dine on.

When the stork flew off – backlit by a brooding sky with heavy neck and spindly legs outstretched – it looked like a pterodactyl. As it disappeared the excitement and wonder settled to a sense of real privilege. Although Greg Clancy's doctoral study is finished he is still keen to monitor these magnificent birds. If you are lucky enough to see one please note the time, date and location and phone Greg on (02) 6649 3153 or email gclancy@tpg.com.au

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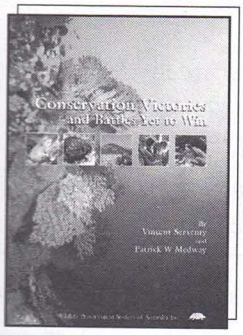

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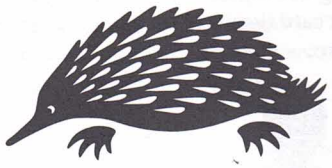

WILDLIFE PRESERVATION SOCIETY OF AUSTRALIA LIMITED

Wildlife Preservation Society of Australia Limited (Founded 1909)

PO Box 42 Brighton Le Sands NSW 2216

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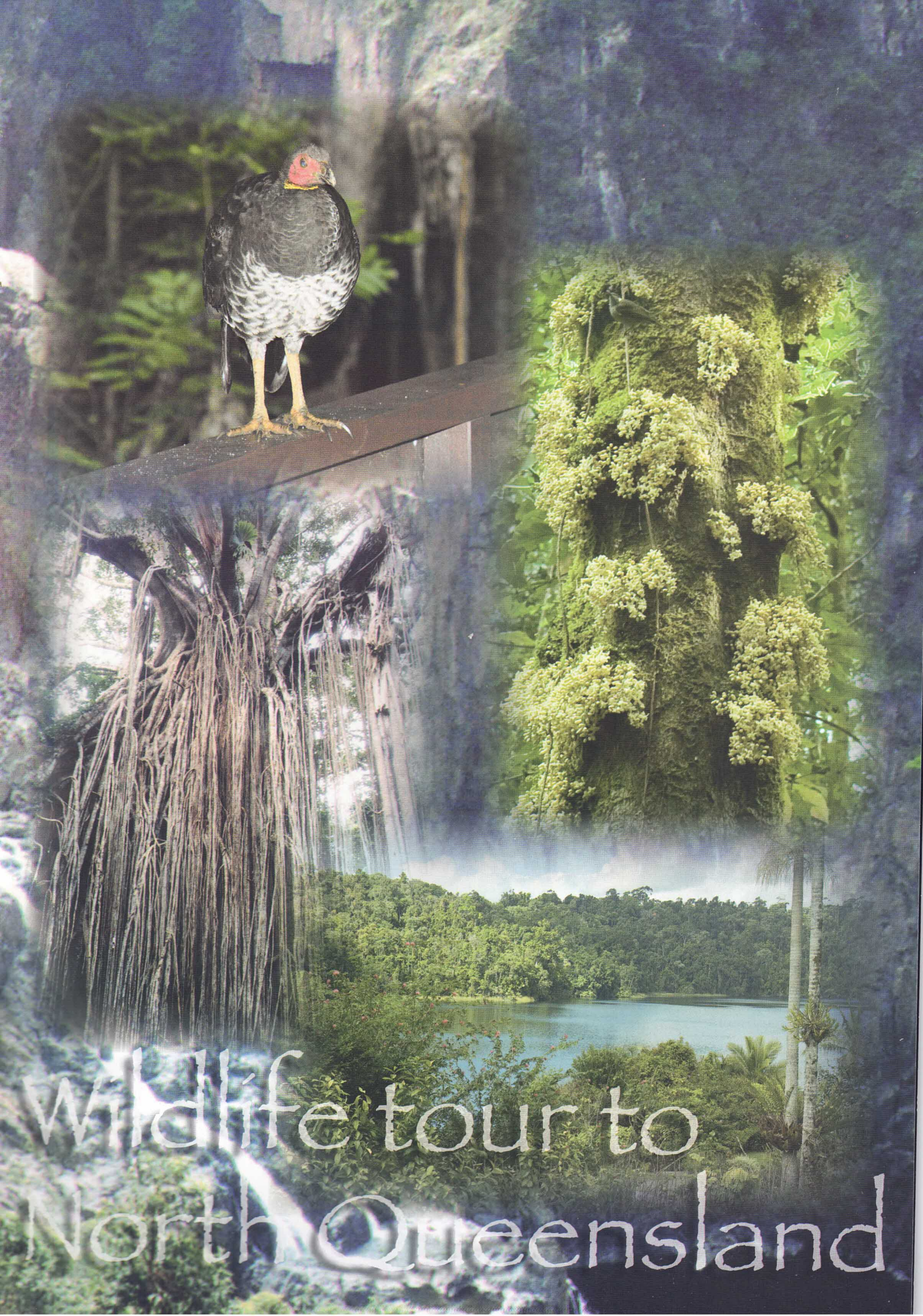
"The challenge to the present adult generation is to reduce the increasing pressures on the Earth and its resources - and to provide youth with an education that will prepare them emotionally and intellectually for the task ahead."

PATRICK W MEDWAY AM
National President


Wildlife tour to
North Queensland

Photographer: David Maynard
Species: Tambja verconis
Common name: nudibranch
Location: Sorrento Pier, Port Phillip Bay, Victoria

Tambja verconis is a distinctive and common nudibranch found along southern Australia's coast. Tambja Verconis feeds solely on the green-blue bryozoan Bugula dentata (in picture). This bryozoan inhabits sheltered clear-water sites along the coastline. As coastal waters come under increasing pressure from habitat modification, pollution from coastal towns and cities and climate change, the distribution of the bryozoan will change. If the bryozoan Bugula dentata is lost, so is the nudibranch Tambja verconis.

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