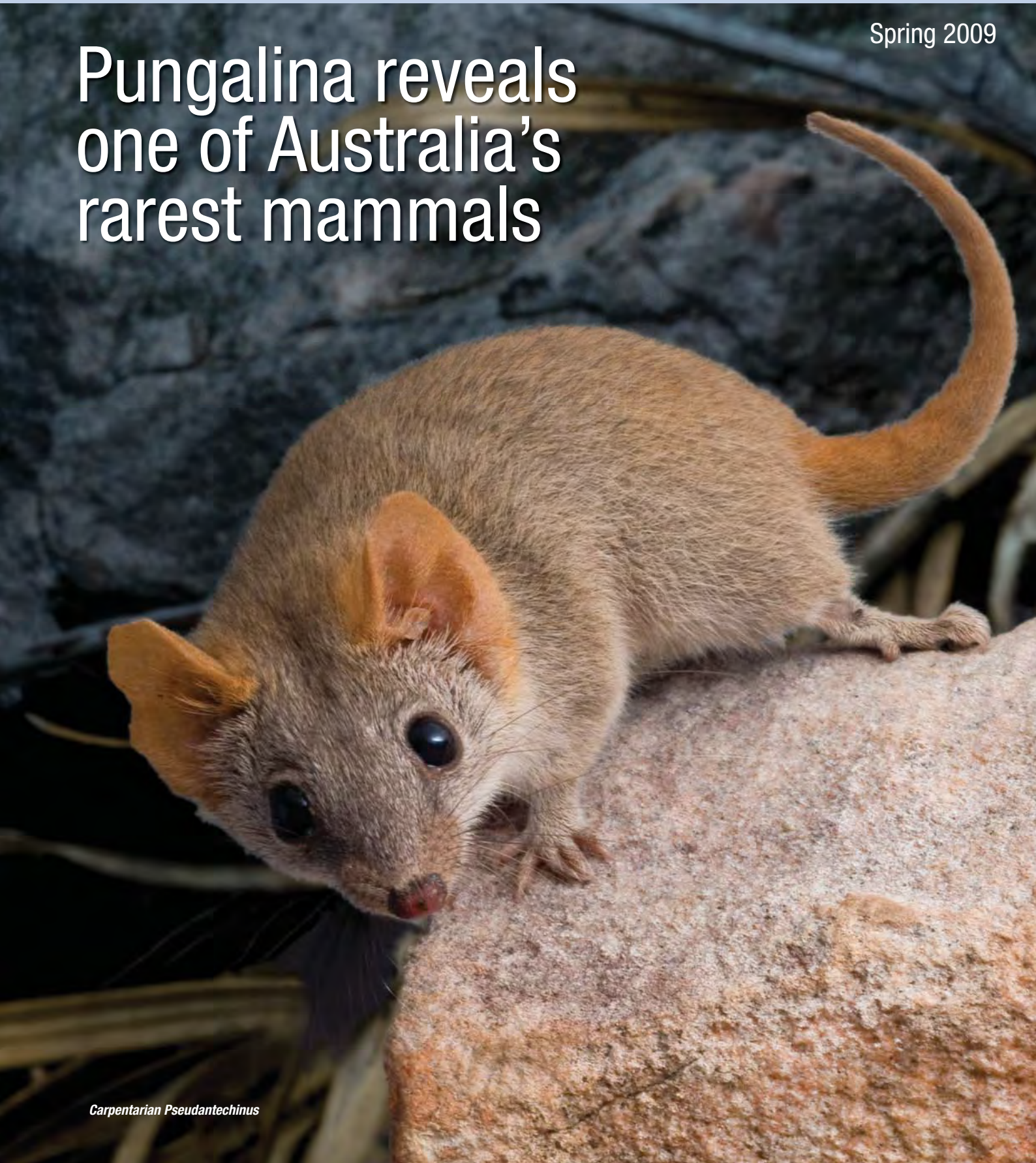
wildlife matters

australian wildlife conservancy

Spring 2009

Pungalina reveals one of Australia's rarest mammals



Carpentarian Pseudantechinus

saving australia's threatened wildlife


Pictograph

australian wildlife conservancy

Welcome to the Spring 2009 edition of *Wildlife Matters*. As this edition goes to print, we are in the process of finalising the acquisition of Bowra (see pages 4-5), a 14,000 hectare property located in the heart of the Mulga Lands in Queensland. Bowra will be our 21st sanctuary, bringing the AWC network to more than 2.56 million hectares (6.3 million acres).

While the overall scale of the portfolio is impressive, it is not the number of properties or hectares that really count. A more accurate measure of the value of the portfolio is the number of species and ecosystems that occur within the AWC estate. In this respect, the statistics are even more impressive – for example, around 80% of all Australian terrestrial bird species and over 60% of all terrestrial mammal species occur on one or more of our sanctuaries.

The fact that our portfolio captures such a high percentage of Australia's wildlife species reflects a deliberate, science-based strategy to ensure that AWC invests in properties of the highest environmental value. This strategy takes into account the potential of each property to act as a catalyst for broader landscape-scale programs. This is illustrated by the EcoFire project (pages 14-16): from our base at Mornington-Marion Downs (over 500,000 hectares), AWC works with pastoralists, indigenous communities and other stakeholders to deliver fire management across more than 5 million hectares of the Kimberley.

The EcoFire project highlights one of the factors that make AWC unique within the non-government conservation sector – the scale of our on-ground operations. Whether it is delivering fire management across millions of hectares or establishing the largest feral-predator free area on mainland Australia (see Scotia on page 19-21), AWC is committed to active, land management. Around 80% of our staff are based in the field!

Our on-ground operations are tightly integrated with our science program. As well as implementing important long-term research on issues such as dingo-cat interactions and the effect of grazing and fire management, AWC's science program has resulted in some stunning recent discoveries including:

- A Carpentarian Pseudantechinus at Pungalina-Seven Emu (only the 20th individual of this species ever caught!)
- A Papuan Sheathtail Bat at Piccaninny Plains (only the 15th individual ever caught in Australia).

Ultimately, we need to measure our success in terms of whether we are delivering "effective conservation" for the species on our properties. While we have a great deal of work still to do, our ecological health measures are demonstrating stable or increasing populations of key species: for example, the world's largest remaining population of the Bridled Nailtail Wallaby at Scotia, more than 800 Boodies at Faure Island and healthy populations of small mammals, Gouldian Finches and Purple-crowned Fairy-wrens at Mornington.

These achievements have been possible only because of your support. Thank you to all of our donors, partners, volunteers and other supporters. With your continued support, we will provide a more secure future for Australia's wildlife.

Atticus Fleming
Chief Executive

the awc mission

The mission of Australian Wildlife Conservancy (AWC) is the effective conservation of all Australian animal species and the habitats in which they live. To achieve this mission, our actions are focused on:

- Establishing a network of sanctuaries which protect threatened wildlife and ecosystems: AWC now manages 20 sanctuaries covering over 2.56 million hectares (6.3 million acres).
- Implementing practical, on-ground conservation programs to protect the wildlife at our sanctuaries: these programs include feral animal control, fire management and the translocation of endangered species.
- Conducting (either alone or in collaboration with other organisations) scientific research that will help address the key threats to our native wildlife.
- Hosting visitor programs at our sanctuaries for the purpose of education and promoting awareness of the plight of Australia's wildlife.

about awc

- AWC is an independent, non-profit organisation based in Perth, Western Australia. Donations to AWC are tax deductible.
- During 2007/08, more than 90% of AWC's total expenditure was incurred on conservation programs, including land acquisition. Less than 10% was allocated to development (fundraising) and administration.

Cover Photo: The Carpentarian Pseudantechinus is one of Australia's rarest mammals (see page 10). This individual was captured at Pungalina-Seven Emu and photographed before release (photo: W. Lawler)

australian wildlife conservancy
PO Box 8070 Subiaco East WA 6008
Ph: +61 8 9380 9633
www.australianwildlife.org

north head sanctuary

Australian Wildlife Conservancy is set to play a key role in the management of the North Head Sanctuary on Sydney Harbour. Commencing in September 2009, AWC has been engaged by the Sydney Harbour Federation Trust, a Federal Government agency, to provide critical scientific input and land management advice at the Trust's North Head site.

North Head is far more than just an iconic landmark on Sydney Harbour. The headland, covering over 350 hectares, is of national significance for conservation: an area rich in flora and fauna in the heart of Australia's largest city.

- North Head is home to a number of threatened species, including the Powerful Owl, and the endangered North Head population of the Long-nosed Bandicoot.
- It contains the largest remaining area of one of Australia's most endangered ecosystems – the Eastern Suburbs Banksia Scrub.
- It supports a diverse plant community including more than 50 species of conservation significance.

However, as with much of southern Australia, many species have disappeared from North Head over the last two hundred years. Species like the Eastern Bettong and the Eastern Quoll once frequented North Head and the environs of Sydney Harbour, but are now extinct across mainland Australia. More recently, small mammals like the Brown Antechinus have probably disappeared from North Head although they survive in other parts of the Sydney Basin.

Local community groups, led by organisations such as the North Head Sanctuary Foundation, have long-campaigned for North Head to become a wildlife sanctuary. The aspirations of the community were realised in 2007 when the Federal and State Governments agreed to manage North Head as a sanctuary.

North Head Sanctuary

At that time, AWC prepared an Operational Plan for the sanctuary which set out the following vision:

"To protect and restore the habitats and wildlife of North Head, establishing a sanctuary that will act as a powerful symbol of the Australian community's connection with the land and its commitment to reverse the decline in our natural heritage."

AWC has now been engaged to implement high priority science projects at North Head and provide advice in relation to ongoing land management. Our work will focus on issues such as conservation of the Long-nosed Bandicoot, the control of feral cats and the impact of rats on vegetation and native wildlife. In addition to the Harbour Trust, which owns around 75 hectares of North Head, we will be working with other landholders (such as the NSW National Parks and Wildlife Service) and stakeholders (such as Manly Council and the North Head Sanctuary Foundation) as part of a "whole of headland" approach to protecting this remarkable place.

AWC's newest staff member – ecologist Nelika Hughes – is in the process of setting up her office at North Head. We look forward to inviting supporters to visit the North Head Sanctuary to see some of the work that Nelika and the AWC team, together with our partners, are carrying out.

We believe that North Head is potentially an important catalyst for broader efforts to halt and reverse the tide of extinctions in Australia. If we can restore habitats and wildlife at North Head, in the heart of Australia's largest city, it will surely provide new hope for the conservation and restoration of wildlife populations across Australia.

Long-nosed Bandicoot, North Head A. Lothian

bowra
a hotspot for Australia's threatened birdlife

Bowra Station is a jewel in the heart of the Mulga Lands of southern Queensland. Located on the Warrego River plains, within the catchment of both the Warrego and Paroo Rivers, Bowra is set to become AWC's 21st wildlife sanctuary. It is renowned as one of the country's most rewarding birdwatching destinations.

Bowra has been held by the McLaren family for five generations. However, Ian and Julie McLaren recently made the difficult decision that Bowra must be sold. Fortunately, Australian Wildlife Conservancy has secured the contract to acquire the property, ensuring that its diversity of habitats and wildlife can be protected in perpetuity. Subject to AWC raising sufficient funds by 30 June 2010, the property will be destocked from July 2011 and a detailed conservation program commenced at that time.

The birds of Bowra

More than 200 species of birds have been recorded on Bowra, which is a remarkable tally for a property of this size. Iconic birds such as Hall's Babbler, Chestnut-breasted Quail-thrush, Bourke's Parrot and Chirruping Wedgebill are a feature of the property. Fourteen species of parrot and 18 diurnal raptor species further highlight the significance of Bowra. The Grey Falcon breeds here, and it is one of the few places in Australia where the Black Falcon is regularly sighted. Bowra is a stronghold for many other threatened and declining birds including Major Mitchell's Cockatoo, Painted Honeyeater, Brown Treecreeper, Squatter Pigeon, Crested Bellbird and Diamond Firetail. Around 50 species of waterbirds also occur, including the threatened Painted Snipe and a number of internationally protected migratory species.

Mammals, reptiles and frogs

Bowra is located at the confluence of two subregions. The resulting variation of land forms, topography, soil types and vegetation supports a large number of mammals, reptiles and frogs. Small mammals include the Fat-tailed Dunnart, Stripe-faced Dunnart and the rare Kultarr. Other small mammals expected to occur include the Narrow-nosed Planigale and the Sandy Inland Mouse. The reptile fauna will be diverse: the threatened Yakka Skink has been sighted on the property and suitable habitat is present for another threatened reptile - the Woma Python.

Management Priorities

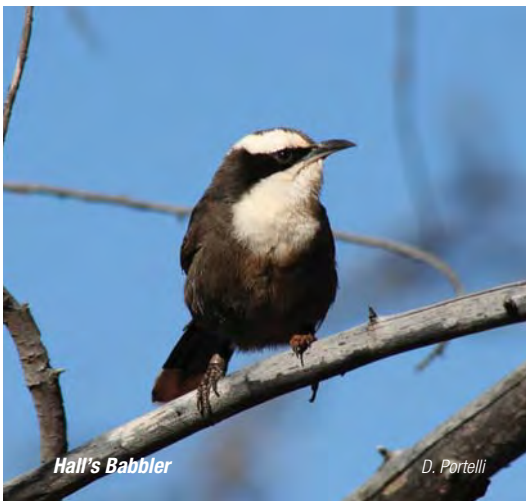
Large areas of the Mulga Lands bioregion are degraded: many ecosystems are threatened and their condition continues to decline. Bowra provides a vital refuge within this broader landscape for a range of species, including many restricted range species such as Hall's Babbler. However, the acquisition of Bowra by AWC is only the first step in providing for its long-term protection. Active land management will be required to address the key threats to Bowra and its wildlife. Management priorities include:

- The control of feral animals, especially goats, rabbits, foxes, pigs and cats.
- Management of weeds such as crownbeard, noogoora burr & buffel grass.
- Erosion control.
- Maintenance of infrastructure (roads, fences etc).
- Fire management.

AWC will also implement a rigorous science program, measuring the ecological health of Bowra and undertaking scientific research on key issues affecting biodiversity.

The property will remain open to birdwatchers, and Friends of Bowra may wish to volunteer their time to assist with the land management program and elements of the science program.


Chestnut-breasted Quail-thrush *D. Portelli*


Hall's Babbler *D. Portelli*


Grey Falcon *D. Portelli*

Budgerigars in flight — *W. Lawler*

BOWRA: property profile

Location

- Bowra is located near Cunnamulla in southern Queensland. It is in a high priority bioregion: the Mulga Lands bioregion has less than 3% reservation level.

Area

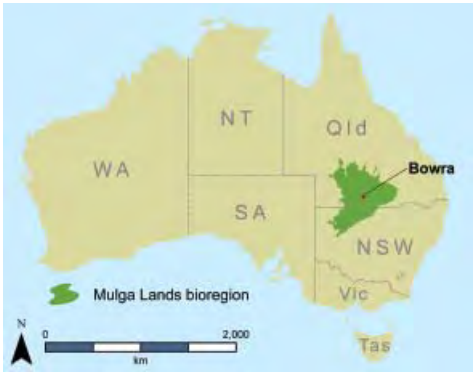
- Bowra covers approximately 14,000 hectares (35,000 acres).

Ecosystems

- Bowra protects 15 regional ecosystems, none of which occur on other AWC properties:
  - 6 of these broad ecosystem types are listed as threatened.
  - 5 of the ecosystems are not found in any national parks, while another 7 are poorly protected in national parks.
- The condition of the habitats on Bowra is very good. There is a fine-scale mosaic of habitat types, with good structural complexity, thus supporting a diversity of wildlife.
- Features of the property include:
  - Mulga communities, often mixed with Poplar Box and bloodwoods, dominate the low scarp and elevated ridges in the northern section of the property.
  - Alluvial plains decorated by gidgee and Coolabah open woodlands.
  - Majestic River Red Gums guard the length of Gumholes Creek, the property's major watercourse. Bowra hosts numerous other wetlands ranging from Bluebush swamps to gilgais and other smaller swamps.

Wildlife

- Bowra is home to:
  - Over 200 bird species.
  - An estimated 31 mammal species.
  - More than 65 reptiles and over 20 amphibians.
- The property is home to at least 12 rare and threatened fauna species.



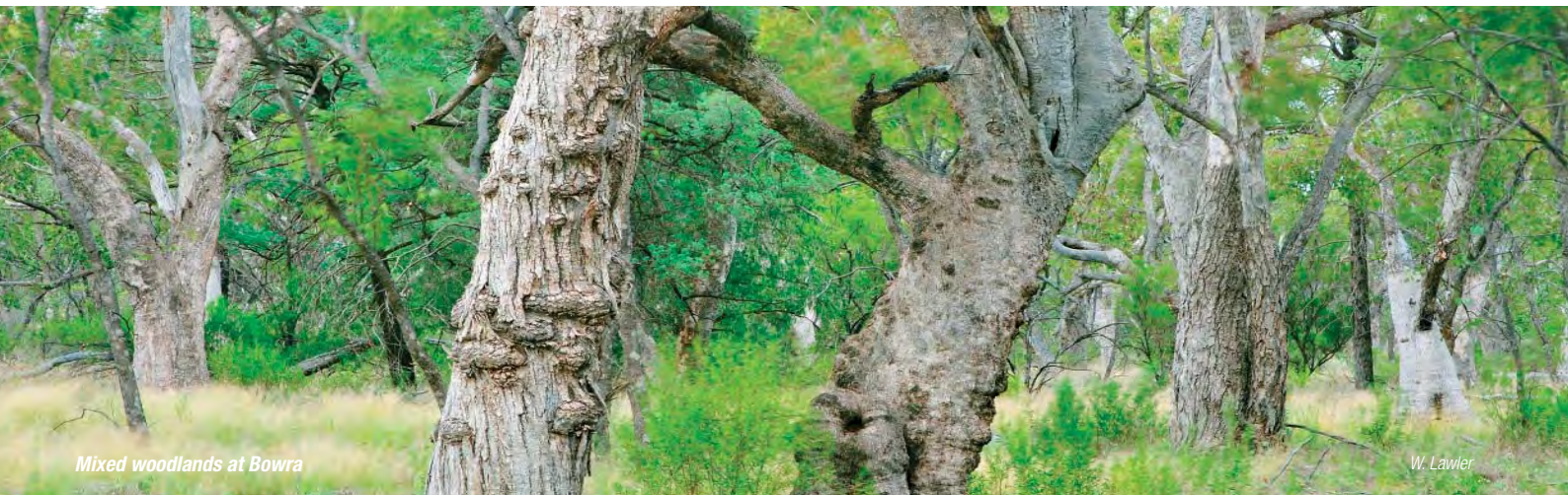
Your donation will be matched

The Federal Government has made a generous grant from the National Reserve System to assist with the purchase of Bowra. However, implementing an active land management program at Bowra, informed by the best available science, will require a significant investment of resources. We need your help to raise an additional $1 million to protect Bowra from threats such as feral animals, weeds and wildfire.

A generous supporter has pledged to match all donations for Bowra until we meet our target of $1 million: so your donation will effectively be doubled.

All donations of $300 or more, and all monthly pledges of $35 or more, will be acknowledged on a special plaque that will be erected at Bowra to commemorate the 'Friends of Bowra'. Please join the campaign to protect Bowra by making a tax deductible donation (see form with this newsletter or visit www.australianwildlife.org).

Thank you to Birds Queensland, Birds Australia, Bird Observation and Conservation Australia (BOCA) and the range of other organisations helping to provide a secure future for Bowra.

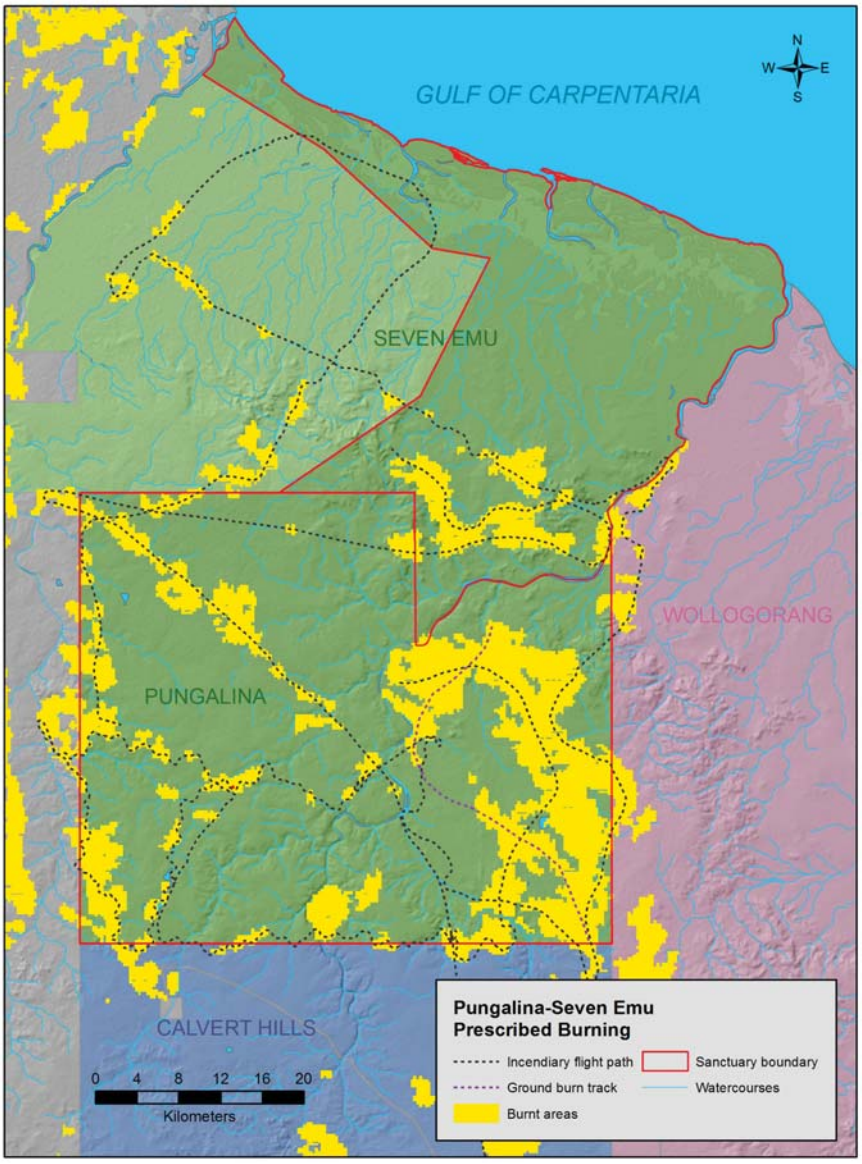


Mixed woodlands at Bowra — *W. Lawler*

pungalina-seven emu

Pungalina-Seven Emu Wildlife Sanctuary is an area of outstanding conservation significance. Covering more than 300,000 hectares (750,000 acres) in the Gulf of Carpentaria, the sanctuary encompasses over 55 kilometres of pristine coastline, more than 100 kilometres of the nationally significant Calvert River and a diversity of ecosystems including coastal rainforest, extensive woodlands, sandstone gorges and a variety of springs and wetlands.

This diversity of habitats, occupying a gradient from the upland escarpment to the coastal plain, makes Pungalina-Seven Emu a vital refuge for the wildlife of the Gulf of Carpentaria, including many rare and threatened species. In this article, we provide a progress report on two of our highest priorities in establishing the Pungalina-Seven Emu Wildlife Sanctuary: the delivery of fire management and the conduct of our initial biological survey.



Fire management

Fire is an integral part of the ecology of north Australia. However, fire patterns across the north have altered dramatically in recent decades in response to changes in land use. Frequent, intense and extensive fires have become more dominant. The increase in such fires is responsible for declines in many animal groups, including small mammals, seed-eating birds (like the Gouldian Finch), and fire-sensitive plants.

Accordingly, our highest immediate management priority at Pungalina-Seven Emu has been to implement effective fire management. Our aim is to reduce the frequency and extent of intense (mid to late dry season) fires. The best way to achieve this is to conduct a prescribed burning program in the early dry season, when weather and grass curing conditions result in smaller, low intensity burns.

Our first step in achieving this objective at Pungalina was to develop a prescribed burning plan with the Garawa traditional owners. In April 2009, AWC staff met with traditional owners, representatives from the Northern Land Council and members of the Garawa Rangers at the Robinson River community. Relying on the local knowledge of Garawa traditional owners, combined with fire history maps (generated from archived satellite imagery), we jointly developed a burn plan for Pungalina. The plan aimed to bolster the barrier effect of 'natural firebreaks' like rivers and roads, create buffers around fire-sensitive areas like springs and rainforest pockets, and "break up" single blocks of same-age vegetation (to minimise the risk of losing large areas in a single wildfire).

Implementation of the agreed prescribed burning program involved aerial incendiary operations (ie, dropping incendiaries from a helicopter), plus a complementary ground-based program carried out by the Garawa Rangers. Traditional owner representatives participated in the helicopter work, helping to guide operations and providing advice on sites of significance.

Martin Copley with AWC field staff and volunteers on the Calvert River

W. Lawler

The map on the previous page shows the flightpaths and resultant firescars from the prescribed burning operations. Burns are concentrated along the eastern boundary, because prevailing southeasterlies make this the direction of greatest fire risk during the mid to late dry season. Note also the firescars running along rivers and at the base of escarpments (enhancing their effectiveness as firebreaks).

AWC also worked closely with Frank Shadforth (the owner of Seven Emu) in relation to the burning on Seven Emu, and with pastoral neighbours at Wollogorang Station and Calvert Hills Station. This helped to coordinate fire management across property boundaries: a key element in successful fire management. While it is early days, the map shows how the prescribed burning on Pungalina-Seven Emu is embedded in a larger regional picture. AWC will continue to work with neighbours, traditional owners and the Northern Land Council to improve fire patterns in the Gulf.

Survey reveals biological treasures

The first comprehensive survey of Pungalina-Seven Emu has confirmed its significance for the conservation of northern Australia's wildlife. In addition to recording one of Australia's rarest mammals (the Carpentarian Pseudantechinus), other highlights of the survey included the discovery of a turtle that may prove to be a new species and confirmation that the property is indeed a refuge for some of northern Australia's rapidly declining mammal species.

Coastal palm forest, Seven Emu

W. Lawler

Organising the expedition...

The survey at Pungalina-Seven Emu was carried out in May-June this year. Led by our Northeast Regional Ecologist, Dr John Kanowski, it was the culmination of months of planning and preparation. Surveys always take a lot of organising, and this survey was more complex than usual because of the remoteness of Pungalina-Seven Emu and the relative paucity of biological data from the Gulf.

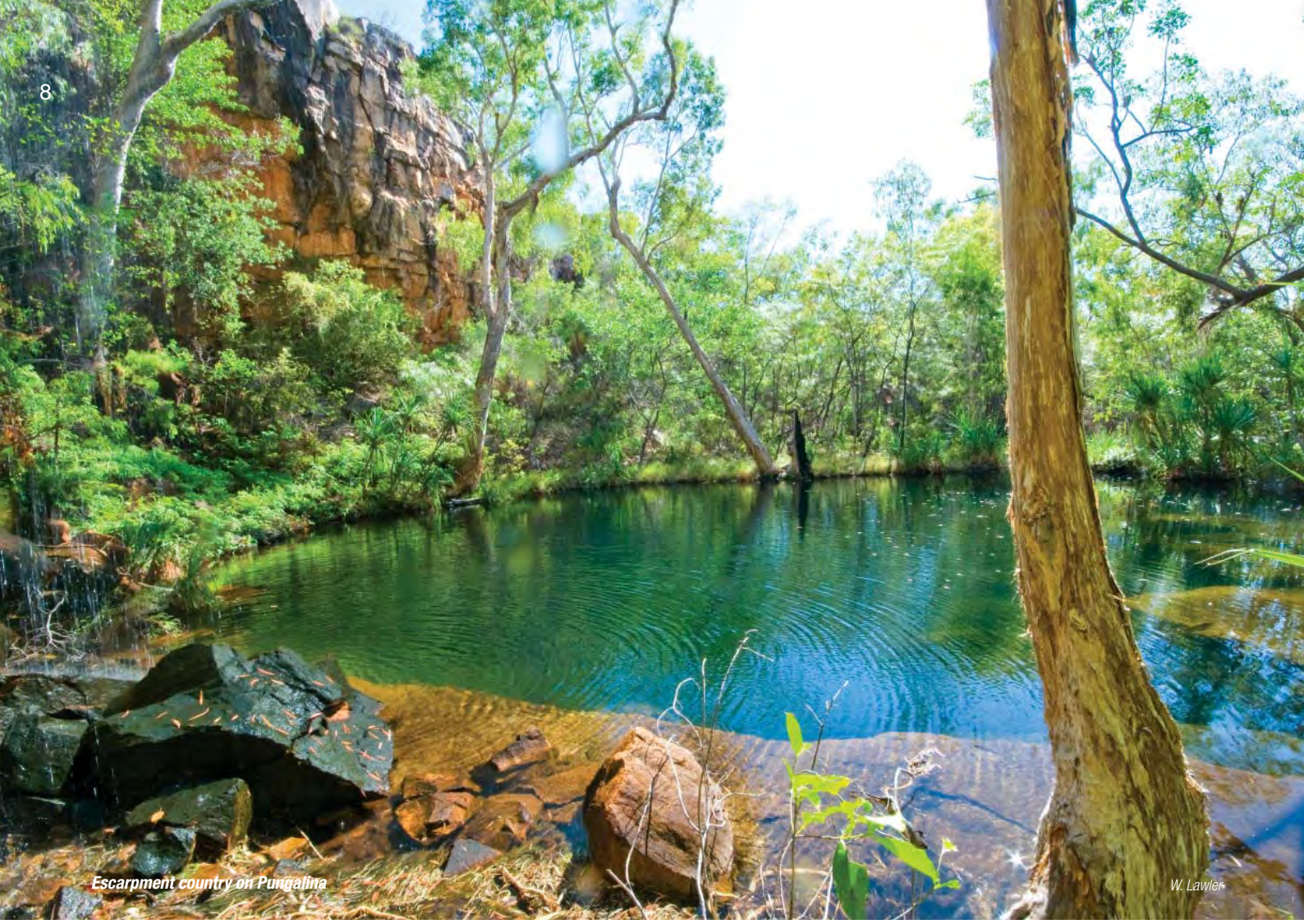
The survey team at Pungalina-Seven Emu comprised eight AWC field staff, including our sanctuary managers (Rod and Beth Beament) plus Frank Shadforth and four volunteers. The team was on site for more than 5 weeks, accessing remote parts of the property by four-wheel drive, quad bike, helicopter, boat and, of course, on foot.

Organising food, supplies and transport for a team of this size in such a remote area is just the tip of the logistic iceberg. An enormous volume of trapping equipment (including odd details like a meter high stack of newspaper for pressing plants, 40 kg of oats and 40 jars of peanut better for bait) and camping equipment needs to be transported to the survey sites after being scrupulously cleaned to prevent disease, fungal and bacterial transmission between properties. Vehicles are also thoroughly cleaned to avoid weed transfer. In summary, there is a lot of hard work even before the survey commences.

Designing the survey

Once the team is on site, it is not a matter of simply setting as many traps as possible. This initial survey at Pungalina-Seven Emu was carefully designed to:

- compile an inventory of animals and plants that are found across the major habitat types on Pungalina-Seven Emu; and
- obtain baseline data on the condition of the sanctuary.



Escarpment country on Pungalina *W. Lawler*

A total of 41 sites were selected across both properties:

- 11 sites in woodlands (mostly eucalypt savanna);
- 8 sites in sandstone gorges (which provide important refugial habitat);
- 6 sites on the edge of the sandstone escarpment;
- 10 sites in wetlands and riparian vegetation;
- 3 sites in the coastal mosaic of dune rainforest, woodlands and grasslands;
- 2 sites in spinifex grassland; and
- 1 site in coastal vetiveria grassland/mangroves.

Each site is surveyed using a standard number and array of traps (cage traps, Elliot traps, pitfall traps, funnel traps, camera traps) as well as active searches, spotlighting, vegetation surveys and the opportunistic collection of scats. In total, the survey team conducted 4674 trap nights across Pungalina-Seven Emu. To put this in context, this represents probably the most comprehensive survey ever conducted on a single property in this part of the Gulf.

A survey like this is very hard work: in addition to the long hours of manual labour (digging holes, moving traps etc), the team spend a week at a time without a shower (Saltwater Crocodiles make the creeks less than inviting); they survive on food that stops them from feeling hungry without actually stimulating the taste buds; and they are up before dawn and work late into the night pressing plant specimens, keying out tricky animals and preparing for the next day. However, once the logistics fall into place there is an intense feeling of satisfaction from the single-minded purpose and the rhythm of the working day, punctuated by moments of great excitement at every new and interesting find.

Exciting biological discoveries

This significant investment of survey effort has paid enormous dividends. Over 231 vertebrate species were recorded including 19 native mammals, 151 bird species and 61 species of reptiles and frogs. This represents over half of the nearly 430 native species that we predict will be ultimately confirmed at Pungalina-Seven Emu.

A high number of threatened and declining species were recorded including Northern Brown Bandicoots, Gouldian Finches, Australian Bustards, and Merten's Water Monitors. Some noteworthy marine species were seen from the beach and from the helicopter, including Indo-Pacific Humpbacked Dolphins, a Loggerhead Turtle (nationally Endangered) and several Green Turtles (Vulnerable), all mixing freely with other water-giants like Saltwater Crocodiles, Shovel-nosed Sharks and Giant Trevally.

Some of the major highlights included:

1. *Carpentarian Pseudantechinus:* The discovery of a Carpentarian Pseudantechinus, one of Australia's rarest mammals, was the highlight of the survey (see inset for more details).
2. *An unidentified freshwater turtle:* The survey team also discovered an enigmatic freshwater turtle which is either a new species or a form of the endangered Gulf Snapping Turtle (see inset for more details).
3. *A mystery dasyurid:* A small unidentified dasyurid was detected in camera traps on the edge of the escarpment, although no individuals were captured in live traps. It appears to be a planigale: if so, it is likely to be an undescribed species of planigale that occurs on rocky ranges in the Northern Territory.
4. *Northern Brown Bandicoots:* Northern Brown Bandicoots were captured at a range of sites, although it was most common in sites associated with wetlands and springs. Bandicoots are one of a suite of small-medium sized mammals that are in catastrophic decline across much of northern Australia; their persistence on Pungalina-Seven Emu is therefore noteworthy.

In the field at Pungalina...

5. *Gouldian Finches:* Gouldians used to occur in dazzling flocks of thousands across the northern savannas, but are now so rare that they are considered nationally endangered. Gouldian Finches were seen several times in small flocks during the survey, and also in the months leading up to the survey by the sanctuary managers, indicating a stable, resident population. This is very near the easternmost limit of the known current distribution for the species.

6. *Restricted range reptiles:* The survey team confirmed the presence of some species with very small distributions, including *Ctenotus striaticeps* (an attractive, strongly striped skink) and *Gehyra borroloola*, a gecko whose entire population is probably limited to Pungalina and the immediate neighbouring properties.

Filling knowledge gaps in the Gulf

One of the important outcomes from the survey was to fill in some critical knowledge gaps about species distributed across the Gulf of Carpentaria. As there have been very few surveys in the Gulf region, there are gaps in the official distribution record for many species. Pungalina and Seven Emu essentially lie within a blank space on the biological map. For example, there are some species that occur to the east (on Cape York Peninsula) or the west (the Top End), but the edge of their range within the Gulf is poorly defined. In addition, there are other species that occur both to the east and the west but have never been confirmed from the Gulf.

In particular, there are 40-odd terrestrial bird species that are known from both Cape York Peninsula and the Top End, but not from the Gulf itself; we confirmed the presence of six of these species on Pungalina - Seven Emu, including the Pacific Baza (a handsome raptor that hunts in the forest canopy), the Little Bronze-cuckoo, the Figbird and the White-breasted Whistler (a coastal specialist).

What did we learn?

While our initial survey was extensive, there are large parts of the property that are still to be explored, including key areas of rocky escarpment, much of the coastal lowlands and the mangrove forests. Nevertheless, we learnt a great deal from this survey:

- The survey confirmed that Pungalina-Seven Emu contains a high number of fauna species, including many threatened species. It is indeed an important refuge for the wildlife of the Gulf region.
- Some of the most important areas for wildlife are also the most vulnerable to wildfire: active fire management is therefore critical.
- While wetlands are vulnerable to feral animals such as horses and pigs, the number of these feral animals is relatively low.
- There are few weeds on the property, although there are scattered clumps of Parkinsonia that require immediate intervention.

Frank Shadforth, Rigel Jensen and John Kanowski *W. Lawler*

Short-eared Rock-wallaby *W. Lawler*

Seven Emu coast *W. Lawler*

pungalina-seven emu

Carpentarian Pseudantechinus

AWC ecologists made a remarkable discovery at Pungalina-Seven Emu when they captured one of Australia's rarest animals - the Carpentarian False Antechinus. Listed as a nationally threatened species, the animal captured at Pungalina is only the 20th individual of the species ever recorded. Also known as the Carpentarian Pseudantechinus, the species was first described from a single female caught in 1905 during a collecting expedition in the Northern Territory. The exact capture location in the vicinity of Alexandria Station was not recorded, and so remains a mystery. Sixty years passed before the species was detected again. In 1967 three individuals were caught in the Pellew Islands in the Gulf of Carpentaria. After another hiatus, a few more individuals were caught in the late 80s, again in the Pellews. It wasn't until 1997 and 2002 that the Carpentarian False Antechinus was caught again on the mainland, this time near Mt Isa in Qld, about a hundred years after its initial discovery.

The Carpentarian False Antechinus is a native carnivorous marsupial related to quolls and the Tasmanian Devil, but is much smaller, weighing just 15-18g (3-4 teaspoons of sugar). At Pungalina-Seven Emu, the Carpentarian False Antechinus was captured in rocky sandstone country at the headwaters of Pungalina and Skeleton Creeks. There is apparently a good population on Pungalina - it was 'captured' on 17 different camera traps. A single female was caught in a live trap. This capture of a live animal was important because it allowed the team to examine it closely, taking morphometric measurements and genetic samples before releasing it back into the wild.

The Gulf Snapping Turtle or a new species?

An enigmatic turtle caught during the surveys at Pungalina-Seven Emu is causing great excitement among AWC scientists. It superficially resembles the Gulf Snapping Turtle, *Elseya lavarackorum*, as it has a characteristic underlating (rather than straight) suture between the humeral and pectoral shields of the plastron (the 'belly' part of the shell). However, other characteristics from this specimen, such as the shape of the intergular shield, do not match *Elseya lavarackorum*. Further work on the taxonomy of the freshwater turtles of northern Australia will be required before we can confirm whether the Pungalina turtle is a new (previously undescribed) species or whether it is a form of the nationally endangered Gulf Snapping Turtle.

In either case, the Pungalina turtle is of great significance: if it is not a new species then it is one of Australia's most endangered turtles. The Gulf Snapping Turtle was first formally described from a fossil found in 1994 near the Gregory River in Queensland. However, the species was then discovered to still exist in a small number of rivers that drain into the Gulf of Carpentaria; this makes the Gulf Snapping Turtle Australia's only living fossil freshwater turtle! The Gulf Snapping Turtle mainly eats leaves, tree roots, fruits and flowers, supplemented with the odd insect. It lays about 15 eggs in nests in the soil of river banks. It is threatened mainly by feral animals - nests are raided by pigs, and nest sites are lost when cattle and other large herbivores damage river banks.

Carpentarian Pseudantechinus

W. Lawler

The mystery turtle

R. Lloyd

The Ghost Bat is Australia's only strictly carnivorous bat

W. Lawler

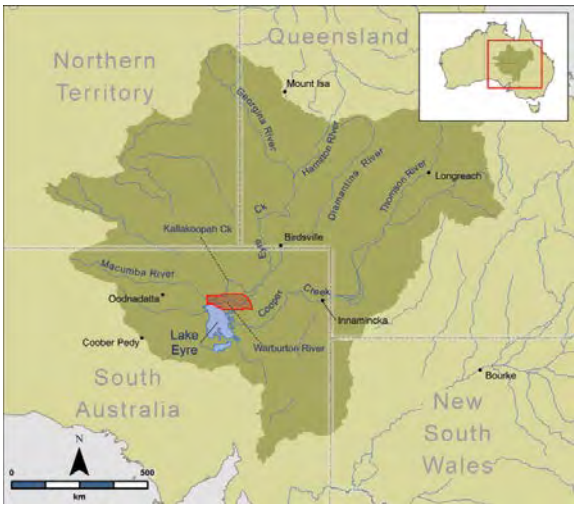
kalamurina wildlife sanctuary

floodwaters bring new era for Lake Eyre basin wildlife

The acquisition and management of Kalamurina Wildlife Sanctuary represents an important strategic investment in the conservation of central Australia's wildlife. In addition to occupying an important position within the Lake Eyre basin, Kalamurina is a vital refuge for threatened species within a global extinction hotspot. Now, with the arrival of floodwaters down the Warburton River and Kallakoopah Creek, a new era for Kalamurina and its wildlife has begun.

In central Australia there lives a native animal that used to go by the common name of Canning's Little Dog, in reference to its large canine teeth which seemed to be always bared. In fact, the eminent South Australian naturalist and explorer Hedley Herbert Finlayson knew them well, describing them as the *"boldest and most ferocious little beast in the country, and having a passion for fat, will raid the camp fearlessly..."*

We now know that Canning's Little Dog is actually two separate species, the Brush-tailed Mulgara *(Dasycercus cristicauda)* and the Crest-tailed Mulgara *(D. hillieri)*. Sadly, both species have declined in the decades since Finlayson knew them. The risk of extinction for the Crest-tailed Mulgara is particularly high and they are now listed as nationally endangered. Nowadays, it is a lucky camper indeed who gets raided in the middle of the night by a Crest-tailed Mulgara. That is, unless you happen to be camping on Kalamurina Wildlife Sanctuary. Preliminary survey results indicate that not only is there a healthy population of Mulgara on Kalamurina – large enough to worry about your camping supplies – but that several other native mammals also find refuge within the boundaries of this massive conservation area.



The Kallakoopah floodwaters extend into the Simpson dune system on Kalamurina

T. Fleming

kalamurina

A vital refuge within an extinction hotspot

Central Australia is one of the planet's extinction hotspots. At least 10 mammals have disappeared from the deserts of the region, approximately half of all mammal extinctions in Australia. One of these animals is the Lesser Bilby, which is commemorated in the AWC logo. The Lesser Bilby was known from only a small number of specimens collected between its discovery in the 1880s and its likely extinction, which probably occurred in the 1950s. The last time the Lesser Bilby was seen alive was in 1932, when Finlayson collected several specimens on a property less than 150 kilometres from Kalamurina. A skull, estimated to be around 15 years old, was later picked up below a Wedge-tailed Eagle's nest in the Simpson Desert in 1967.

While the Lesser Bilby may have disappeared forever, Kalamurina remains a vital refuge for a number of other rare and declining mammals and birds. In addition to the Crest-tailed Mulgara, Kalamurina is a stronghold for the Eyrean Grasswren, which has a fascinating history of discovery, disappearance and re-discovery (see next page). Other threatened and declining mammals on Kalamurina include the Dusky Hopping Mouse and the Kultarr.

While one of our priorities will be to protect and promote the recovery of the threatened fauna that survives at Kalamurina, we are also committed to restoring the biodiversity of this remarkable property. This will ultimately involve the reintroduction of mammals and possibly birds that are regionally extinct but which cling to survival elsewhere. For example, the Burrowing Bettong disappeared from mainland Australia more than 50 years ago but has been reintroduced by AWC at places like Scotia and Faure Island. The return of species like the Burrowing Bettong to Kalamurina will be a powerful statement about our capacity to reverse the tide of extinctions in central Australia.

The floodwaters herald a new era for Kalamurina's wildlife

As if to celebrate our acquisition of Kalamurina, and its new role in providing a more secure future for Australia's wildlife, floodwaters arrived in the Warburton River and Kallakoopah Creek in March 2009. The floods highlighted the important location of Kalamurina within the Lake Eyre basin (see map on page 11). Occupying over 15% of the continent, the Lake Eyre basin is one of the largest internal drainage systems in the world. Lake Eyre itself is the world's fifth largest terminal lake.

Long sections of the Warburton River, Kallakoopah Creek and the Macumba River flow through Kalamurina before they converge on the property and run into Lake Eyre. However, the water which flowed through Kalamurina and into the Lake in early 2009 was significant not just because it substantially filled Lake Eyre, but also because of the ecological boost it provided to the floodplains of the Warburton River. As part of one of Australia's great natural spectacles, the flood extended beyond the main river channel and across the

The floodplain on the Warburton River at Kalamurina *T. Fleming*

Crest-tailed Mulgara captured at Kalamurina J. Schofield

Lesser Bilby P. Schouten

Eyrean Grasswren photographed at Kalamurina T. Fleming

adjacent plains until water lapped against the massive sand dunes of the Simpson Desert. As the waters receded, the floodplains turned a deep green – productivity was restored and new life provided. While such floods occur every few years, this flood will be different – the recent removal of more than 2,000 cattle from Kalamurina means that, for the first time in more than 50 years, the floodplains will not be immediately placed under intense grazing pressure. This will be particularly significant for Coolabahs, which germinate only after significant flooding and only if grazing pressure by cattle and feral herbivores is very low. Kalamurina, which hosts the only stretch of the Warburton River in conservation, could be the site of one of central Australia's most significant Coolabah germination events in decades.

AWC will measure carefully (and report to our supporters) the response of flora and fauna to the recent floods and the destocking of Kalamurina. Given this is the driest region in Australia, it may take time before many ecological indicators respond. To help this process, we are focused also on delivering effective control of camels, horses and donkeys. The control of rabbits, cats and foxes is more complex (many native mammals declined rapidly when cats and foxes "prey-switched" after widespread rabbit control with myxomatosis in the 1950s), but developing and implementing an integrated approach is a high priority for our land management and ecology teams.

Kalamurina is our largest sanctuary. Here, and at our other sanctuaries, we are drawing a line in the sand ... halting and reversing the tide of extinctions, and providing a more secure future for animals like the Crest-tailed Mulgara ... while keeping a hopeful look-out for some sign that the Lesser Bilby clings to survival in the sand dunes of the Simpson Desert.

The Nature Conservancy and the Thomas Foundation joined AWC staff at Kalamurina in May (Kevin Wheldon, Rob McLean, Max Bourke, David Thomas, Steve Murphy, Josef Schofield, Don Rowlands and Tony Fleming).

The Nature Conservancy and the Thomas Foundation

Kalamurina was purchased with support from thousands of people around Australia. Two of the most significant contributions were made by the Federal Government (who contributed 50% of the acquisition price) and The Nature Conservancy (TNC). TNC has provided more than $1 million under The Thomas Challenge including almost 50% of the acquisition price and funds for management. Both TNC and the Thomas Foundation are important partners in AWC's work across many of our sanctuaries, helping to conserve places in northern and central Australia as part of TNC's global effort to effectively conserve 10% of all natural habitats on Earth.

Eyrean Grasswren

The Eyrean Grasswren is the star of one of Australia's greatest ornithological stories: a story that began and continues on Kalamurina.

On 18 December 1874, six specimens of a new species of grasswren were collected from a brackish waterhole on the Macumba River on Kalamurina by FW Andrews, the naturalist on the Lake Eyre Expedition. The specimens were lodged in the South Australian Museum; Waterhouse was the curator at the time and sent two skins to the British Museum. Within two years, John Gould had used these two skins to formally describe the species as the Eyrean Grasswren, *Amytornis goyderi.*

Following this typical entry of a species into scientific existence, the bird promptly and atypically disappeared. Decades went by without any reports of the bird, prompting Campbell (one of the grandfathers of Australian ornithology) to issue a public call for sightings in *The Emu*, Australia's premier ornithological journal. The article was accompanied by the delicate (and under the circumstances, haunting) plate produced by Gould 50 years earlier. Meanwhile, the specimens left in the SA Museum had disappeared, either through neglect or from being sold by unscrupulous museum staff to private collectors. The Eyrean Grasswren had disappeared from both the natural and the museum world after only one sighting!

In 1944, one of the original 6 specimens was found in the Australian Museum. The skin had been donated from a private collection and then incorrectly filed. This tantalising discovery re-ignited the curiosity of ornithologists across Australia - had we lost the Eyrean Grasswren forever?

Finally, after much effort, the Eyrean Grasswren was rediscovered in 1961 on the lower Macumba - once again on Kalamurina - 87 years after its original discovery. The bird remains one of Australia's least-known birds, and is high on the priority list for many keen birdwatchers. It is relatively common in certain areas on Kalamurina, although always difficult to see.

ecofire:
on-ground management and science deliver results in the Kimberley

Many AWC supporters will be familiar with the Kimberley EcoFire project, which is now in its third year. Covering 5 million hectares, it is fire management on a grand scale. Based on science, and involving on-ground collaboration between 14 properties, it is delivering a measurable improvement in fire patterns across the central and northern Kimberley. In this article, we identify some of the key features underlying the success of the EcoFire project.

Defining the problem

In recent decades, fire patterns in the Kimberley have changed markedly. Current fire patterns are characterised by extensive and intense late season wildfires: ie, large areas are now burnt by "hot" fires at the end of each dry season. Individual wildfires can burn nearly a million hectares each. These mega-fires have a significant impact on biodiversity, causing the decline of whole groups of species (eg, seed eating birds). They also damage cultural sites, reduce pastoral productivity and contribute to greenhouse gas emissions.

"There is more fire now, right across the plains, hill, ranges, you know, we lose a lot of bush medicine, bush plants, some of the wildlife gets caught, you know like the mammals and all the trees that we know from before we don't see now because they all burnt down, our grass we don't get the grass medicine like the lemon grass anymore because of wildfire, bushfire, when someone light it at the wrong time of the year - that fire can travel, travel, travel all the way."

Betty Walker, Tirralintji Aboriginal Community

The Gouldian Finch is threatened by altered fire regimes

H. Morgan

Setting clear and measurable objectives

To address this problem, the EcoFire project aims to reduce the incidence of extensive, intense (late season) fires in the central and north Kimberley. This broad aim can be expressed in terms of a set of specific, measurable objectives including:

- Reducing, as a proportion of the total area burnt each year, the area burnt by late dry season wildfires.
- Increasing the heterogeneity (patchiness) of fire patterns by increasing the number of unburnt patches per unit area, and reducing the average and maximum size of burnt patches.

From a biodiversity perspective, the ultimate measure of success is whether fire-sensitive species – such as the Gouldian Finch – are responding positively to the EcoFire program.

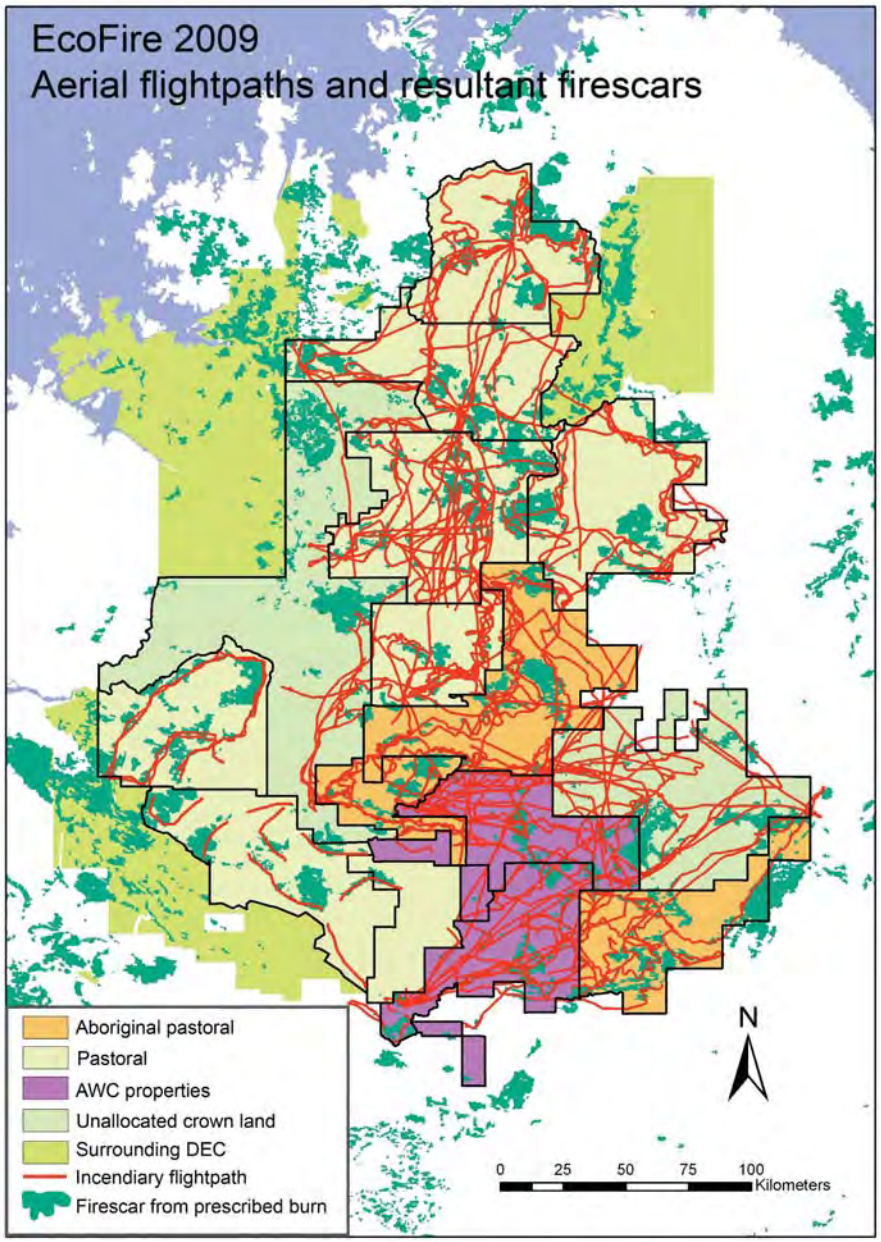
Louise, David and Francis doing prescribed burning with AWC at Yulumbu Community

R. Kingswood

Practical, on-ground delivery of fire management

How does EcoFire seek to meet these objectives? EcoFire does not seek to exclude or prevent fires, but to influence the nature and timing of fires. This is achieved by prescribed burning which reduces fuel loads (ie. grass) in strategic areas (eg. around fire sensitive vegetation), breaks up areas into a patchwork of different fuel ages, and enhances natural firebreaks. This program of prescribed burning is planned, co-ordinated and implemented across an area of 5 million hectares encompassing 14 contiguous properties including conservation, pastoral and indigenous land. It is necessary to operate at this scale because, given the size of individual fires, the actions of any one landholder may be ineffective if neighbours are not also taking action in a co-ordinated manner.

Most of the prescribed burning is carried out from the air: over a period of about eight weeks in April and May, AWC staff and project participants flew over **30,000 kilometres** in a helicopter (the equivalent of Sydney to London return) and dropped over **53,000 incendiaries** to implement the regional burn plan (see map). Each property is visited repeatedly because patches of vegetation are targeted at different times depending on their intrinsic flammability, curing state, and how long ago they were last burnt.



Ground-based burning plays an important role in places that need finer scale work, and around any assets like homesteads and communities. EcoFire helps property owners carry out ground-based burns by providing equipment and other support. AWC collaborates particularly closely with the Tirralintji and Yulumbu indigenous communities, on Mornington and Tableland (a neighbouring property), and works with a small team from these communities to burn on Mornington, Marion Downs and Tableland Stations.

Collaboration with all landholders

The project involves participants with diverse land use goals – pastoralists, indigenous communities and a conservation organisation. However, we all share a common desire to look after country. As the project leader, AWC works with land owners and managers to develop prescribed burning plans on individual properties that are then coordinated across property boundaries and linked with the fire plans of neighbours to produce an integrated regional plan. To help participants, AWC provides them with fire histories, based on satellite imagery. This technological input is combined with the local knowledge of landholders, including traditional knowledge.

The owners and managers take an active role in the implementation of the prescribed burning program, providing feedback on weather, grass conditions and the fire plan, accompanying AWC staff in the helicopter during aerial burning, and by carrying out complementary burns from the ground. EcoFire also collaborates with organisations like the Department of Environment and Conservation, Fire and Emergency Services Authority and the Kimberley Land Council, all of whom provide support and assistance.

ecofire (continued)

(With EcoFire) I think a lot more people… are putting a bit more effort into (fire management) and actually thinking a bit more instead of just haphazardly burning. I know that last year was the first time since I have been at Mt House that we haven't had to go out and put a fire out on Mount House…until you're actually involved with a big fire… and it's your land at risk, it's definitely the most heart-wrenching environmental thing that I've ever been through.

Cait Westlake, Mt House Pastoral Station

Sarah, Butch, Wallace, Diane, and Jock doing Yulumbu fire planning *R. Kingswood*

Brett and Peter Lacy (Mt Elizabeth Station) with AWC's Richard Kingswood *B. Maher*

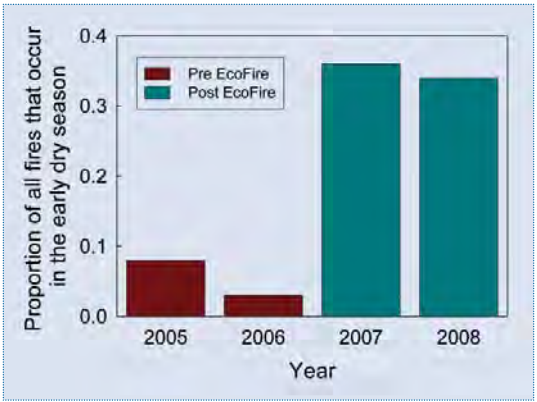
Measuring progress

AWC measures progress toward EcoFire objectives at two levels:

- At a regional level, we measure the impact on fire patterns (ie, has the project met its primary objective and changed fire patterns).
- At Mornington, we measure whether the change in fire patterns has benefited fire sensitive species.

Changes in regional fire patterns are monitored by using satellite imagery to map fire-affected areas throughout the year. After the first two years (2007 and 2008), the results are clear: individual fires are now smaller and more scattered and a higher proportion of fires are occurring at a "good" time (the early dry season, rather than the late dry season). This spatial data can be summarised in quantitative metrics – for example, the graph below demonstrates that the prescribed burning program has 'converted' many fires from late dry season into early dry season fires. EcoFire is clearly meeting its objective in relation to changing fire patterns.

At Mornington, intensive programs are in place to monitor the effect of fire management on key indicators species. The population sizes of indicators like Purple-crowned Fairy-wrens, Brown Quail and small mammals have all increased. While the program is still in its infancy, this suggests EcoFire (combined with AWC's feral animal control and other land management initiatives) is delivering a real benefit to the ecological bottom line: the diversity and abundance of native wildlife.



EcoFire has significantly increased the proportion of fires that occur in the early dry season ('good' fires)

During 2007-09, EcoFire was supported by funding from the Federal Government, administrated by the Rangelands NRM Co-ordinating Group.

piccaninny plains
a new model for collaboration

AWC and The Tony and Lisette Lewis Foundation, a private charitable conservation foundation based in Sydney, have joined forces to develop and implement an exciting new model for collaboration in the private conservation sector.

The conservation significance of Piccaninny Plains

Piccaninny Plains covers 170,000 hectares of northern Cape York Peninsula. The property contains a diversity of ecosystems and wildlife reflecting a unique evolutionary blend of Australia and New Guinea. It has extremely high conservation significance.

- At a landscape level, Piccaninny Plains provides an important ecological link between the east and west coasts of Cape York.
- Piccaninny Plains contains a high number of ecosystems including a rich mosaic of wetlands, tropical grasslands, woodlands and rainforests. Several ecosystems are particularly notable - for example, one rainforest type is found only on Piccaninny Plains.
- Over 420 birds, mammals, reptiles and frogs are expected to occur on Piccaninny Plains including many found nowhere else in Australia except on Cape York Peninsula.

The Tony and Lisette Lewis Foundation

Piccaninny Plains is owned jointly by AWC and The Tony and Lisette Lewis Foundation. The Foundation was established in 1988 by the late Mr Anthony Calvert Lewis and his wife Lisette. Through its WildlifeLink program, it is dedicated to the propagation, preservation and protection of wildlife in Australia and the conservation of its habitat. The express wish of Tony Lewis was that TLLF-WildlifeLink be involved in the acquisition, management and maintenance of land for the conservation of wildlife.

Working together: the model for collaboration at Piccaninny Plains

The relationship between AWC and TLLF-WildlifeLink began in 2004, with TLLF-WildlifeLink providing substantial support for projects such as the construction of a research centre, genetics laboratory and associated infrastructure at Mornington Wildlife Sanctuary. TLLF-WildlifeLink Directors - Gail Baker, Richard Chadwick and Peter Kellaway - visited several AWC sanctuaries to witness "first hand" the work undertaken by AWC field staff. As the relationship between AWC and TLLF-WildlifeLink strengthened, the potential for an exciting collaboration involving the joint acquisition of land began to develop.

In late 2006, AWC and TLLF Directors began the process of searching for a suitable property to be considered for joint acquisition. Desktop assessments were followed by field inspections and detailed consideration of conservation values, land prices and the appropriate structure for our collaborative model. The process culminated in a visit to Piccaninny Plains, where sightings of Palm Cockatoos on the Wenlock River, Spotted Cuscus in the Archer River gallery forest and an extraordinary display of waterbirds on Green Swamp helped inspire our joint commitment to the conservation of Piccaninny Plains.

The collaborative model embraced by AWC and TLLF-WildlifeLink is the first agreement of its kind in Australia. Key elements of the agreement include:

- AWC and TLLF-WildlifeLink hold the title to Piccaninny Plains as tenants in common (50% each).
- A management committee of AWC and TLLF-WildlifeLink representatives is established: it meets quarterly to review progress, receive reports and make decisions on budgets and management priorities.

AWC's John Kanowski with TLLF Directors Gail Baker and Richard Chadwick

G. Kelly

A Papuan Sheathtail Bat at Piccaninny Plains

L. Hogan

Green Swamp, a magnificent wetland on the Archer River floodplain W. Lawler

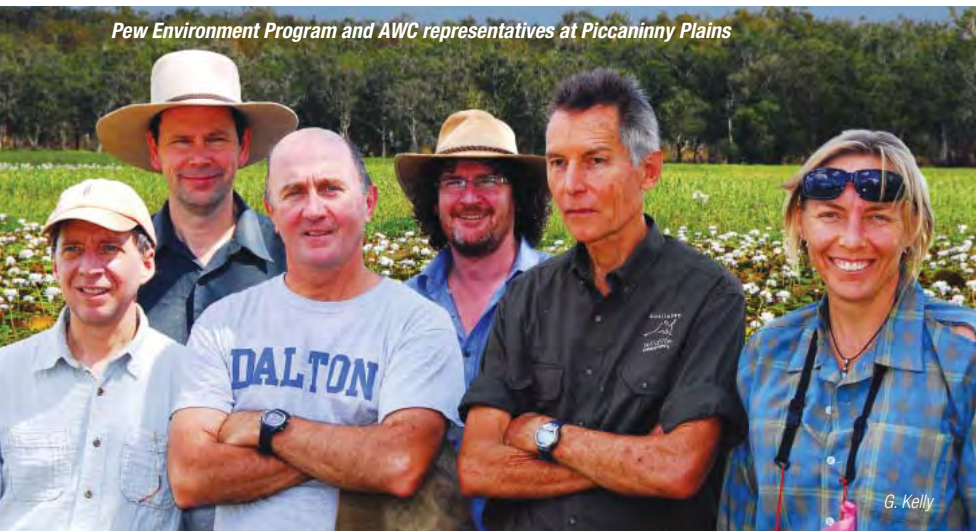
- AWC is appointed as the Manager of Piccaninny Plains. That is, AWC undertakes the on-ground land management and science program and reports to TLLF-WildlifeLink on implementation.
- AWC and TLLF-WildlifeLink contribute 50% each toward annual Operating and Capital Costs.
- Each party has given the other party a right of first refusal over its 50% interest.

The importance of the Piccaninny Plains model

The collaborative model established at Piccaninny Plains is a ground-breaking initiative for private conservation in Australia. It provides a framework under which a party – whether an individual or a charitable entity – can acquire land in partnership with a non-profit organisation like AWC. While elements of the model could be varied to suit the particular circumstances of any case, the key advantages are:

- An individual or organisation like TLLF-WildlifeLink can hold the title (or a percentage of the title).
- As manager of the land, AWC brings to the collaboration our extensive experience and depth of expertise in land management (fire management, feral animal control etc) and science (biological surveys, research etc).
- AWC is able to deliver management in a cost-effective manner.
- The agreement provides AWC with security in terms of its ongoing involvement with the property, whether or not we are on the title.
- From AWC's perspective, the model reduces our need to raise funds for capital (acquisition) and provides certainty in relation to financing the operational (management) costs.

We believe the Piccaninny Plains model is an important development for conservation in Australia. It is potentially a significant catalyst for mobilising additional private sector investment in conservation, and an example of AWC's innovative and business-like approach to conservation.



Pew Environment Program and AWC representatives at Piccaninny Plains G. Kelly

Early success: the model in practice...

The model has delivered significant early progress at Piccaninny Plains:

- *Feral animal control:* the population of feral horses on Piccaninny Plains has been substantially reduced.
- *Biological survey:* over 7000 trap nights have been conducted during baseline surveys in 2008 and 2009, along with vegetation surveys, bird surveys, and spotlight searches. This work confirmed the presence of threatened and iconic species such as the Grey Cuscus and the Palm Cockatoo. The discovery of a Papuan Sheathtail Bat (see picture) has caused particular excitement because the species has been recorded in Australia less than 15 times.
- *Research:* several projects have been initiated including research on the effects of grazing and on the interaction between Dingoes and cats.

Support from The Nature Conservancy and Pew Environment Group

Thank you to all who have helped support AWC's role in the acquisition and management of Piccaninny Plains. We particularly acknowledge The Nature Conservancy (TNC) and The Pew Environment Group, who provided a grant of US$500,000 from their Wild Australia program (www.wildaustralia.org). The Wild Australia program is a three year program designed to help protect Australia's bush, desert and oceans. TNC is a highly valued partner of AWC, having worked with us on a range of projects (see Kalamurina article on page 11-13). TNC works with a range of partners in Australia including indigenous and conservation organisations. The Pew Environment Group tackles the world's great environmental challenges, combining strategic investments, sound science and smart partnerships to protect areas like Piccaninny Plains and address issues such as climate change.

scotia:
measuring the success of our endangered mammal program

At Scotia Wildlife Sanctuary, AWC has created the largest feral predator-free area on mainland Australia. Foxes, cats, rabbits and goats have been removed from an area of 8,000 hectares (20,000 acres). Dominated by vast sand dunes cloaked in old growth mallee and spinifex, this feral-free wilderness is the site of one of the world's most ambitious biodiversity reconstruction projects: the reintroduction of 6 threatened mammal species. Five years after the initial releases, evidence collected by AWC's team of ecologists and land managers at Scotia demonstrates that the endangered mammal project at Scotia has been a resounding success.

The list of species reintroduced at Scotia reads like a "who's who" of Australia's threatened mammals ... the Bridled Nailtail Wallaby was presumed extinct for almost 50 years, the Boodie and Greater Stick-nest Rat clung to survival only on offshore islands, the Woylie is spiralling towards extinction and the Greater Bilby and the Numbat are two of Australia's most iconic threatened mammals. At Scotia, AWC is providing a more secure future for each of these species in a project described by Sir David Attenborough as "a vitally important project for Australia and the planet".

This article provides information on the population of each reintroduced species at Scotia and a description of the processes we have in place to measure changes in those populations over time. The article highlights two of the reasons why the Scotia project is so important:

- Scotia protects populations of six of our most endangered mammals, playing a critical role in the survival of each species.
- AWC has put in place a rigorous process to measure outcomes (eg, mammal populations) – this science-based approach to measuring success helps us improve and adapt our management. The approach is very rare within the conservation sector, but AWC believes it should be "core business" for all conservation organisations.

Woylie (Brush-tailed Bettong)

S. Trocini

scotia:
measuring the success of our endangered mammal program

Why do we track the population of Scotia's endangered mammals?

There are very few conservation areas in Australia which track the populations of their threatened species in the manner that we do at Scotia and at our other sanctuaries. This scarcity of effective monitoring programs partly reflects the challenges involved in setting up and implementing such programs: for example, it requires a significant investment of resources and staff time "in the field"; it requires a high level of scientific skill to ensure the monitoring program generates meaningful data; and it requires organisational discipline and commitment to ensure that monitoring is implemented at set intervals and over the long-term.

Despite these challenges, AWC has made it a priority to measure the ecological health of our properties. At Scotia, this includes measuring the populations of our threatened mammal species. For our staff, this involves many long hours (and late nights) in the field. However, the information on population size and trends is vitally important for the following reasons:

- *Improving conservation management:* the monitoring results tell us whether we are delivering effective conservation for the endangered mammals at Scotia; if populations are declining, it is likely that we need to refine our land management strategies and the monitoring data will inform decisions about any changes to land management.
- *Integration with research projects:* our monitoring results also help identify knowledge gaps which we can then address through research (eg, is there competition for resources between ecologically similar species like Boodies and Woylies?)
- *Improving financial management:* by comparing our financial investment with our ecological outcomes, we hope to be able to allocate resources so as to generate the highest possible return (ie, maximise the population of Bilbies with our available funds!)
- *Accountability:* many AWC supporters have contributed to the Scotia project; our monitoring program provides a measure of the ecological returns that your investment has generated.

A tale of two Bettongs

Woylies (Brush-tailed Bettongs) and Boodies (Burrowing Bettongs) once numbered in their millions across southern Australia, before being driven to the brink of extinction by feral predators and habitat loss. Both species were declared extinct in NSW prior to their return to the wild at Scotia. In order to estimate the population size of both species in Scotia's Stage 1 area (4,000 hectares), AWC has set out a permanent grid of over three hundred cage traps. At sunset during the trapping period, these are baited with delectable balls of peanut butter, rolled oats and honey. After midnight on three consecutive nights, the ecology team returns to these traps to see what they've captured and to take all of the necessary measurements (weight, length, genetic samples etc). This gruelling but highly rewarding task usually takes until sunrise ... leaving ecologists sleep deprived but deeply satisfied.

Boodies and Woylies appear to love the traps (or at least the peanut butter and rolled oats used in the bait). Nearly every Boodie or Woylie in Stage 1 is likely to be trapped during each monitoring session, providing a relatively accurate estimate of their population size. Figure 1 shows the population estimates of these two species since their reintroduction in 2005, when 170 Woylies and

Scotia is home to the largest population of the endangered Bridled Nailtail Wallaby

W. Lawler

120 Boodies were released. The Woylie population then declined to around 30, where it has stayed ever since. Conversely, the Boodie population has gone from strength to strength with almost 300 now estimated to occur in Stage 1.

Why did the Boodies increase while the Woylies initially decreased? It is likely that the habitat at Scotia suits Boodies more than Woylies, such that the carrying capacity for Woylies in Stage 1, where Boodies are present, is around 20-30 and successful breeding and recruitment will only occur in years of above average rainfall. (Scotia has had below average rainfall for the past decade). The original distribution of these species supports this hypothesis: Boodies were found throughout the arid central deserts, whereas Woylies had a more semi-arid and temperate distribution. Boodies are better adapted to drier conditions, being able to avoid the heat of the day by resting in their burrows, whereas the Woylie rests up above ground in the shade.

Given the apparent competitive advantage of Boodies, we have released only Woylies in Stage 2, with 57 animals reintroduced last year. In the absence of competition with Boodies, the Woylie population has already increased slightly.

The overall stability of Scotia's Woylie population is important given the species has declined precipitously during the past two years at the few remaining populations in south-western Australia (except at AWC's Karakamia and Yookamurra Sanctuaries, where the populations remain high and stable). Why are Woylies 'doing better' at AWC sanctuaries? The answer is probably that most significant threats to Woylies have been removed at the AWC sanctuaries - the Woylie populations occur in feral-free areas, surrounded by feral-proof fences – ie, we provide complete protection from cats, foxes and the competitive impacts of rabbits and goats.

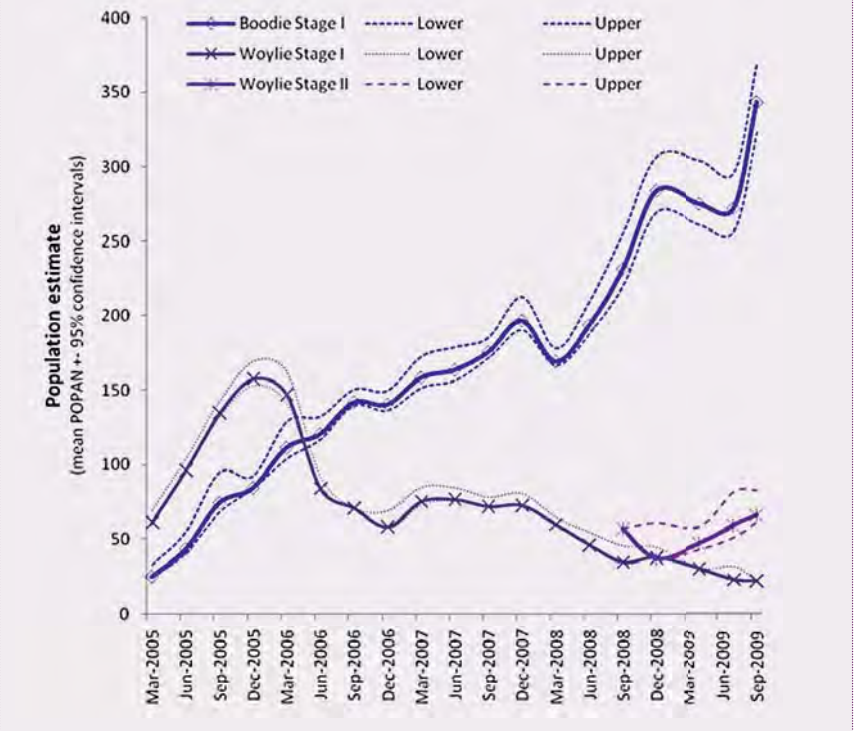


Fig. 1 Population estimates for Boodies and Woylies since their reintroduction in 2005.

Bilbies, Bridled Nailtail Wallabies and Numbats

While trapping is a good technique for measuring Boodie and Woylie populations, it is not useful for generating meaningful population size estimates for Bilbies, Bridled Nailtail Wallabies and Numbats. None of these species are readily captured in traps. Accordingly, we use a different technique to estimate population size – "distance sampling". This involves driving a set route around Scotia recording all of the animals that are seen. When an animal is seen, we record the distance it is from the track. The data we collect is then fed into a computer program, which applies some complex calculations involving change in 'detectability' with increasing distance from the track in order to estimate population size.

Using this method, we estimate there are over 550 Bilbies, about 55 Numbats and over 150 Bridled Nailtail Wallabies in Stage 1 (plus more than 500 additional Bridled Nailtail Wallabies in Stage 2 and other areas). To verify this technique, we have compared Boodie population size estimates generated by trapping versus by distance sampling - the two methods produce almost identical estimates.

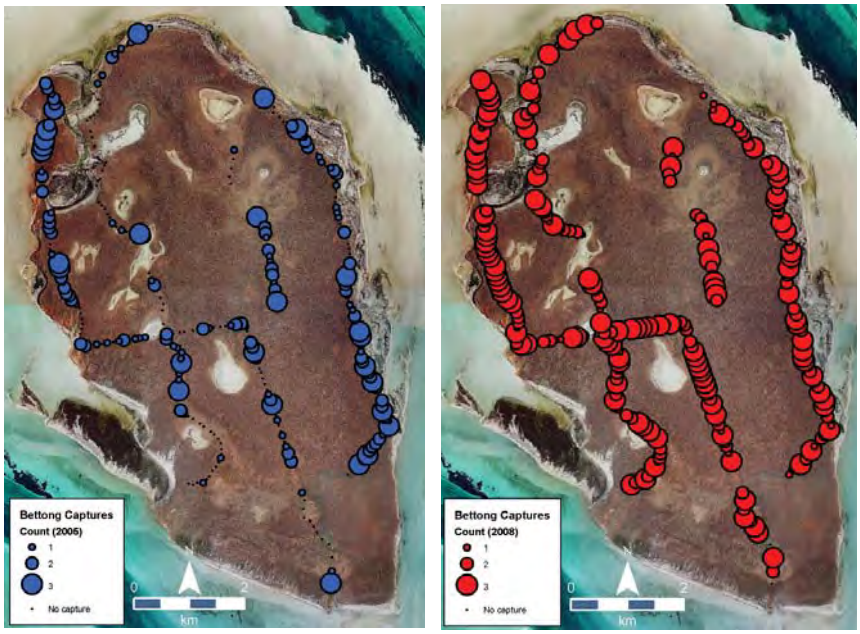
A footnote... the value of feral-proof fencing

AWC is unique within the non-government sector in terms of our expertise in conducting translocations of threatened species. We have carried out a large number of translocations and our monitoring programs show that our success rate has been much higher than average. The monitoring data also allows us to analyse what influences the probability of success during translocations. The overwhelming contributor to success is whether the key threatening process has been adequately controlled. For many species of small and medium-sized mammals, the key threat is feral animals (especially predators). The reintroduction programs at Scotia and Karakamia have been resounding success stories because feral animals were removed (and remain excluded) from the reintroduction site. Feral-proof fencing will continue to be one of our best options for the management of feral animals. In the longer term, the development of measures for landscape control of foxes and cats may release us from relying solely on feral-proof fences. However, for the time being, fences are a vital management tool in halting the tide of mammal extinctions in Australia.

faure island

Faure Island Wildlife Sanctuary lies within the Shark Bay World Heritage Area and contains many of the values that make the region a place of global significance. The 6000 hectare island is also a key site in AWC's reintroduction program. In 2001, it became the third largest island in the world from which cats had been eradicated.

Following the subsequent eradication of goats, a series of translocations to Faure Island means that it is now an island paradise for five highly threatened mammal species: Boodies, Western Barred Bandicoots, Shark Bay Mice, Greater Stick-nest Rats and Banded Hare Wallabies. In addition to playing a key role in preventing the extinction of these native mammal species, the reintroduction program is also helping to restore the ecological integrity of the island.



Figures 1 and 2: Trapping results for Boodies on Faure Island (2005 and 2008)

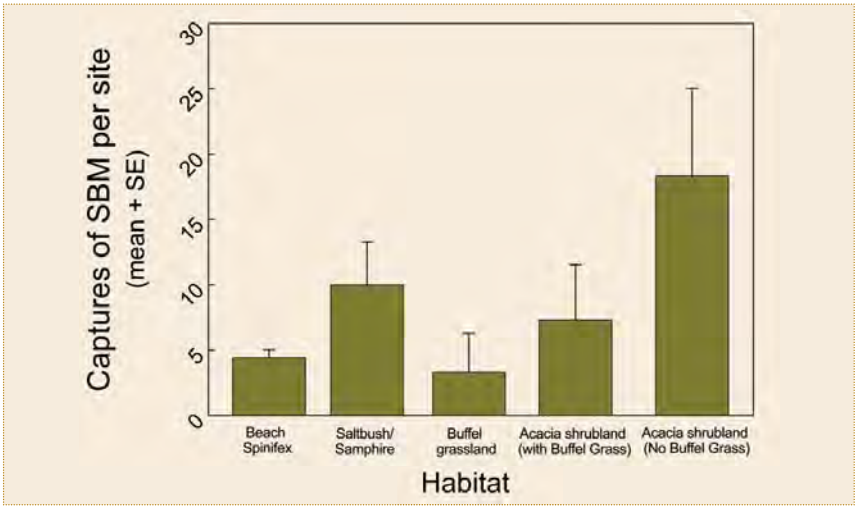


Figure 3: Abundance of Shark Bay Mice in each vegetation type

Monitoring programs to measure the success of the mammal translocations have been an important part of the reintroduction program at Faure Island (as on other sanctuaries - see the Scotia article on pages 19-21). Beginning in 2002, regular trapping at set locations across the island charted the spread of species as numbers increased. For example, the maps (see Figures 1 and 2) show that in 2005 Boodies were concentrated in certain areas of the island, but by 2008 their density was higher and they were evenly distributed across the island: the overall trap success had more than doubled.

The spectacular success of the Boodie reintroduction had a side effect that has forced a modification of our approach to measuring the health of the translocated populations. Being so plentiful, Boodies saturate the traps as quickly as the southwest team of ecologists can set and bait them, making it difficult to assess the status of any other species. To circumnavigate this (welcome) problem, we redesigned the trapping surveys. Instead of spreading traps evenly across the island, we now set 25 traps in a small quadrat at 15 locations. Our plan is to set more traps than there are Boodies at each quadrat, thereby making sure that some traps are left 'free' for other species. In addition, some traps are placed inside a PVC tube that has a large gauge grill at the entrance which excludes Boodies, but not smaller species like Shark Bay Mice.

The new trapping design systematically samples the major vegetation communities of Faure Island, and we are already gleaning new information about habitat preferences as a result. For example, we are learning more about the ecological requirements of the Shark Bay Mouse, which is one of Australia's most endangered native rodents. Early results utilising our amended monitoring design indicate that Shark Bay Mice are less abundant in shrublands that have an understorey of buffel grass, an introduced weed (see Figure 3). This result provides the ecological support and justification for the control of buffel grass on the island, and is a good example of how AWC integrates its science and land management programs to improve management decisions and conservation outcomes.

curramore wildlife sanctuary

A recent fauna survey at Curramore Wildlife Sanctuary, located in the subtropical hinterland north-west of Brisbane, has confirmed a wealth of biodiversity, including several threatened species. In addition to providing an inventory of Curramore's fauna, the survey represents an important step in measuring the response of wildlife to the removal of lantana from the property.

Led by local ecologists, Susie Duncan and Tony Bright, the Curramore survey revealed a high number of species on AWC's smallest property – in total, 13 frogs, 25 reptiles, 70 birds and 24 mammals were recorded. This concentration of biodiversity is due partly to the good condition of the habitats, and partly because Curramore straddles a wide variety of subtropical ecosystems, including rainforest and wet sclerophyll forests, on a range of elevations and soil types.

The survey also confirmed a number of threatened species. Curramore has a sizeable population of the Marsupial Frog (*Assa darlingtoni*), a resident of the subtropical rainforests. Frogs are not generally renowned for being caring parents - most species find a suitable-looking puddle and then leave their eggs, tadpoles and froglets to it. The Marsupial Frog is a quirky exception. Females lay clutches of a dozen or so eggs on damp earth. Once the tadpoles hatch, they climb up the male's legs and lodge themselves in pouches (made from modified skin flaps) on dad's inside thighs. The male carries his tadpoles like pocket change for around ten weeks, hence its alternative common name - Hip-pocket Frog.

Subtropical Antechinus *W. Lawler*

Marsupial Frog *T. Bright*

Another threatened species recorded during the survey was the Golden-tipped Bat (*Kerivoula papuensis*) - a rare inhabitant of the east coast's rainforests and wet sclerophyll forests. This bat was first discovered by Carl Lumholtz in 1884 near Rockhampton. It was recorded again near Cooktown in 1897, and then 'disappeared' for almost a hundred years, until a single individual was trapped in 1981 near Cairns. Golden-tipped Bats have specialised habits - during the day they roost in the abandoned hanging nests of Yellow-throated Scrubwrens and Brown Gerygones, while at night they hunt web-building spiders.

The Short-limbed Snake-Skink (*Ophioscincus truncatus*), Plumed Frogmouth (*Podargus ocellatus plumiferus*) and Stephen's Banded Snake (*Hoplocephalus stephensii*) are another three threatened species that were recorded for the first time at Curramore. Two spectacular and threatened invertebrates were also encountered - the Richmond Birdwing Butterfly (*Ornithoptera richmondia*), and the southern sub-species of the Pink Underwing Moth (*Phyllodes imperialis*). Both invertebrates depend on a single plant species for particular parts of their life cycle.

As well as fulfilling an important inventory function, a number of the survey sites were located in areas with different levels of infestation by lantana - a serious weed in the region. AWC has an active and very successful lantana removal program on Curramore; repeated fauna surveys will reveal how ecological communities re-assemble following the removal of this noxious weed. Two field open days were held during the surveys, providing an opportunity for the community to encounter the wildlife and learn about their ecology, as well as witness the extensive and successful weed management efforts to date on Curramore.

newhaven wildlife sanctuary
summer rain inspires desert wildlife

Newhaven covers over 260,000 hectares near the intersection of three bioregions, nearly 400 kilometres north-west of Alice Springs. A joint project with Birds Australia, the property is an important refuge for threatened species of the arid zone such as the Brush-tailed Mulgara and the Great Desert Skink. AWC's managers at Newhaven – Josef Schofield and Danae Moore – oversee implementation of an integrated land management and science program featuring extensive biological surveys and dedicated fire management and feral animal control programs.

At the beginning of this year, Newhaven enjoyed good summer rain after a protracted dry spell. Many arid zone species have adaptations to allow them to capitalise on these infrequent and unpredictable rainfall events. For example, Desert Spadefoot Toads and Trilling Frogs emerged from 18 months of enforced dormancy to use the ephemeral puddles and shallow lakes for breeding. Hawk Moths similarly exploit the brief window of breeding opportunity - during February the Tar Vine Caterpillars were especially common, amassed upon the fresh plant growth of Tar Vine.

The effects of the summer rain were apparent in Newhaven's annual series of surveys carried out between March and May, which includes checking one hundred 2 hectare plots and 70 km of road transects for animal tracks, nearly 210 bird surveys, 60 vegetation surveys, and approximately 6,000 trap-nights.

The three species of dunnart most common at Newhaven (Stripe-faced, Ooldea, and Lesser Hairy-footed) had clearly been living the dolce vita over summer - and storing those indulgences in their very swollen tails. Record captures of Fat-tailed Psuedantechinus were another mammalian treat. Many reptiles had been breeding, as evidenced from the demographic breakdown of the capture records (most animals were juveniles) and also the sheer number of individuals caught – over 1200 snakes and lizards! The surveys added three new reptile species to the sanctuary species list (Chief Ctenotus, Orange-naped Snake, and Shovel-nosed Snake) and the recently described *Delma desmosa* was confirmed, bringing the number of reptiles known to occur on Newhaven to an amazing 70 species.

The abundance of some mobile species particularly increased - the track surveys revealed high activity of Little Button-quails, moving onto Newhaven to take advantage of the locally plentiful grass seed and invertebrates. Brush-tailed Mulgara tracks also turned up outside their core habitats - suggesting that individuals were moving around more widely.

Rain in the arid zone is a strong driver of behaviour and population changes, but some observations need to be interpreted cautiously. For example, the capture success for small native rodent species was lower than the previous year. However, their abundance as estimated from tracks was similar or higher, and captured females had higher pregnancy rates. The surfeit of grass seed probably caused native rodents to eschew the medley of peanut butter, oats used as trap-bait.

Thorny Devil *R. Lloyd*

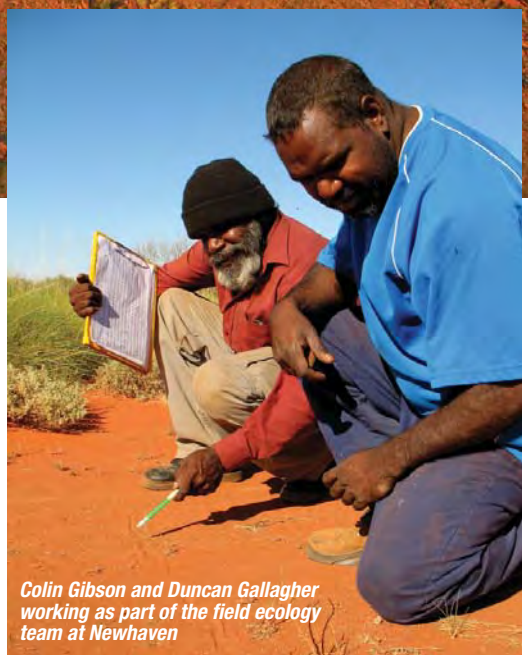
Desert Spadefoot Toad *J. Schofield*

Mengden's Brown Snake *R. Lloyd*

Tar Vine Caterpillars *J. Schofield*

Rugged ranges on Newhaven

W. Lawler



Colin Gibson and Duncan Gallagher working as part of the field ecology team at Newhaven

During the winter months, Newhaven's sanctuary managers turned their attention to camel control (over 200 camels were removed from the sanctuary), weed control (infestations around the homestead and public campground were targeted with the help of Birds Australia volunteers), and fire management (the objectives this year have been to protect specific plant communities, such as old growth Mulga, and to maintain fire breaks).

As the hottest winter on record at Newhaven blends into summer, the focus is switching to monitoring the impacts of camels on vegetation, as well as carrying out surveys for Black-footed Rock-wallabies in the quartzite hills. The land management and ecological monitoring programs at Newhaven are carried out with the help of volunteers as well as members of the local Nyirripi community and the Warlpiri Rangers. The information collected is making a significant contribution to our understanding of arid zone ecology, as well as helping us manage Newhaven more effectively.

wongalara

On the edge of Arnhem Land, Wongalara Wildlife Sanctuary protects a suite of Top End species such as the Hooded Parrot and the Kakadu Dunnart. Chris Whatley, AWC's Sanctuary Manager, and his family have worked with visiting AWC staff and volunteers to deliver a range of important outcomes at Wongalara in recent months:

- *Weed control:* An infestation across several hectares of gamba grass, a highly invasive weed that dramatically alters the structure of woodlands, has been almost completely eradicated. The next priority weed is grader grass - another highly invasive weed that currently occurs as spot infestations at a small number of locations.
- *Feral animal control:* Over 900 feral cattle have been removed from Wongalara, along with over 560 buffalo and 420 donkeys. Annual aerial surveys are tracking whether feral animal densities are decreasing as a result of this control - the next survey is scheduled for November.
- *Ecological health monitoring:* Changes in small bird, mammal and reptile populations are measured annually via standardised trapping and observations at a set of permanent monitoring sites spread across the property (the team carried out 4300 trap nights in July). In addition, changes in larger mammal abundances - especially Dingoes and feral cats - are measured with a systematic series of track surveys. These fauna monitoring programs are partly designed as a research question - to examine whether Dingoes are effective bio-control agents for feral cats, and therefore beneficial for smaller native species. More on this topic in the next issue of *Wildlife Matters.*
- *Biological inventory:* this year's fauna survey added six reptiles, one mammal and 15 birds to the property inventory, including the Partridge Pigeon, which is listed as nationally threatened.

brooklyn and mt zero-taravale

Brooklyn

Brooklyn Wildlife Sanctuary is home to more mammals, birds, reptiles and frogs than any other parcel of private land in Australia. Covering 60,000 hectares, the property stretches from the rainforest-clad mountains of the Wet Tropics to the floodplain of the Mitchell River.

Mick Blackman, AWC's Sanctuary Manager at Brooklyn, has overseen a land management program that has demonstrated remarkable progress since the acquisition of the property in 2004. Our success in delivering effective fire management was recognised recently when the North Australia Fire Managers Forum (primarily comprising government agencies responsible for fire management) held a field day on the property. Mick Blackman and Peter Stanton led the Forum representatives on a tour of key sites, showcasing our progress in achieving a mosaic of different age-since-fire areas.

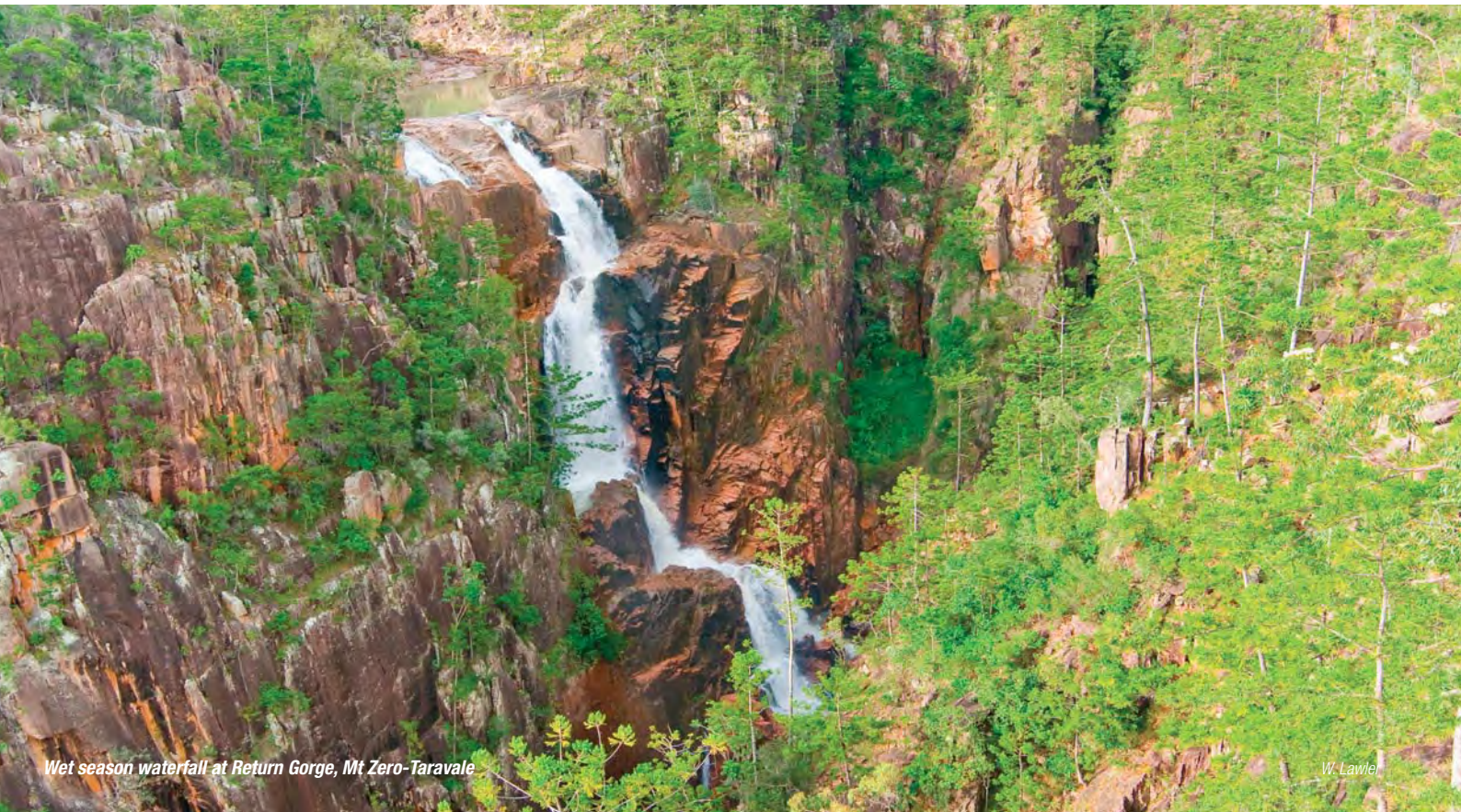
Volunteer groups have been active in helping AWC implement some important on-ground projects in recent months. A group of International Student Volunteers have helped to erect the fencing around Pekin Lagoon that will exclude pigs and feral cattle, but not native animals, from this wetland. The Cairns 4WD Club have begun the task of dismantling and cleaning up stretches of old fencing that, if not removed, represent a potential hazard to wildlife.

Meanwhile, the science team in the north-east are continuing with the preparation of a detailed vegetation map for Brooklyn. This task has highlighted the extraordinary floristic diversity on the property: to date, the team have recorded over 1,350 native plant species on Brooklyn (more than 15% of Queensland's entire flora).

Mt Zero-Taravale

The focus of our on-ground management at Mt Zero-Taravale, implemented by Sanctuary Manager Peter Hensler, has been fire management, weed control and the development of strategic infrastructure including a base for visiting research staff and volunteers. A feature of the science program has been the development of a detailed vegetation map by Peter Stanton.

James Cook University (JCU) is an important partner in much of our science work at Mt Zero-Taravale. As part of our broader program to investigate the relationship between Dingoes and feral cats across Australia, students from JCU recently trialled various camera trap technologies at Mt Zero. The objective was to test a series of baits and lures to find the best attractant to monitor predators using camera traps. In one of the studies, the camera traps recorded 18 Dingoes and only 1 cat from 370 trap-nights. This suggests that a relatively high density of Dingoes may be suppressing feral cats at Mt Zero-Taravale. Thirty-one additional animals were detected including Long-nosed Bandicoots, Northern Brown Bandicoots, Red-legged Pademelons, Rufous Bettongs and other macropods.



Wet season waterfall at Return Gorge, Mt Zero-Taravale W. Lawler

AWC and Optus
saving Australia's threatened wildlife

Since its launch in late 2007, the Optus – AWC partnership has helped deliver some outstanding outcomes for Australia's threatened wildlife at places like Kalamurina, Piccaninny Plains, Mornington and Buckaringa. Threatened species such as the Purple-crowned Fairy-wren, the Yellow-footed Rock-wallaby and the Crest-tailed Mulgara have all enjoyed the benefits of the partnership and its focus on delivering practical outcomes where it really counts – *in the field.*

Optus also came to the rescue early this year when our diesel generator-based power system failed at Scotia Wildlife Sanctuary. A specific grant of more than $90,000 from Optus helped AWC establish a new solar power array, restoring and greening our power supply. While the solar array – comprising 112 panels – will reduce our greenhouse gas emissions, it will also generate significant cost savings through a reduction in our diesel use. In other words, the investment by Optus will significantly reduce our operating costs in the future – truly a gift that keeps giving!

As the partnership enters its third year, the focus of our partnership with Optus will shift to two exciting projects in northern Australia:

- The establishment and management of the Pungalina-Seven Emu Wildlife Sanctuary, including 55 kilometres of remote coastline in the Gulf of Carpentaria.
- Unlocking some of the secrets associated with the role of the Dingo in helping to protect Australia's threatened mammals by suppressing feral cat numbers and behaviour.

Thank you to Optus, its staff and customers for their wonderful support!

Dingo *R, Faulkner*

Perth Zoo and AWC in new conservation partnership

AWC is proud to have entered into a partnership with Perth Zoo, one of Australia's leading zoological and conservation institutions. The partnership will provide both organisations with a range of opportunities to jointly pursue our collective goal of improving conservation for Australia's wildlife and ecosystems.

Our partnership formalises several years of collaboration between AWC and Perth Zoo. Most notably, Perth Zoo provided the facility and expertise for captive breeding of Shark Bay Mice before their release on Faure Island. Shark Bay Mice are one of Australia's most endangered native rodents, but their successful captive breeding and translocation to Faure Island has created an important "insurance population" which will safeguard the species from extinction.

Under a Memorandum of Understanding executed by Perth Zoo and AWC, future projects may involve:

- additional captive breeding of threatened species for release at AWC sanctuaries;
- promoting public awareness of the plight of Australia's wildlife; and
- staff collaboration through volunteering and other opportunities.

Over 600,000 people visit Perth Zoo each year, making it an ideal place to help connect people with nature and to educate people about the threats to our native wildlife. In addition, Perth Zoo staff possess a wealth of expertise in breeding, conservation medicine and reproductive biology which will be highly relevant to AWC operations and our science program. Being based in Perth, AWC is proud to be formally associated with our local zoo!

we urgently need your help

yes, I want to help save Australia's threatened wildlife


Wongai Ningaui — Lochman Transparencies


Grey Falcon — D. Portelli


Mulga Parrot — W. Lawler

Bowra

☐ Please direct my donation to Bowra.

AWC operations generally

☐ Please direct my donation to AWC operations around Australia.

Commemorative Certificate

☐ I have donated $300 or more or made a monthly pledge of $35 or more. Please send me a certificate commemorating my contribution.

Name: Dr/Mr/Mrs/Ms _____

Address: _____

Suburb: _____ State: _____

Postcode: _____ Country: _____

Telephone: W) _____ H) _____

E-mail: _____

MONTHLY PLEDGE

I wish to become a regular supporter and give a tax deductible donation **each month** of: ☐ $10 ☐ $25 ☐ $50 $ _____ Other (minimum $10)

I wish to pay by:
☐ **Direct debit from my bank account** Please fill in Direct Debit Request (see opposite).
☐ **Credit card** - Please fill in details or call (08) 9380 9633.

DONATION

I would like to make a **single tax deductible** donation of:
☐ $100 ☐ $300 ☐ $1000 ☐ $5000 $ _____ Other (minimum $10)

I wish to pay by:
☐ **Credit card** - Please fill in details or call (08) 9380 9633.
☐ **Cheque/Money Order** - (enclosed) Payable to the Australian Wildlife Conservancy Fund.

Credit Card Details

☐ Mastercard ☐ Visa ☐ AMEX ☐ Diners

Card Number _____ Expiry Date ___/___

Cardholder's Name: _____

Signature: _____

Direct Debit Request

I / We request that you draw by way of the Direct Debit System, $ _____ per month, for the payment of a monthly donation to Australian Wildlife Conservancy Fund.

My/Our Account details are

Institution: _____

Account Name: _____

Account Number: _____ BSB: _____

I / We acknowledge that this Direct Debit Request is governed by the terms of the "Direct Debit Client Service Agreement" (set out below).

Signature: _____

Print Name: _____ Date: _____

Bequests

☐ I am interested in making a bequest in my will. Please send me some information.

☐ Please tick this box if you do NOT wish to receive news and information on our latest initiatives and progress.

Our Commitment to You, Drawing Arrangements:

1. We will advise you, in writing, the details of your monthly donation to Australian Wildlife Conservancy (amount, frequency, commencement date) at least 3 calendar days prior to the first drawing. Thereafter each drawing will be made on the 15th day of each month (or part thereof as specified).
2. Where the due date falls on a non-business day, the drawing will be made on the next working day.
3. We will not change the amount or frequency of drawings arrangements without your prior approval.
4. We reserve the right to cancel your monthly donation to Australian Wildlife Conservancy if three or more drawings are returned unpaid by your nominated Financial Institution and to arrange with you an alternative payment method.
5. We will keep all information pertaining to your nominated account at the Financial Institution, private and confidential.
6. We will promptly respond to any concerns you may have about amounts debited to your account.
7. We will send a receipt within 45 days of the conclusion of the financial year summarizing your entire year's gifts for tax purposes.

Your Rights:

1. You may terminate your monthly donation to Australian Wildlife Conservancy at any time by giving written notice directly to us (PO Box 8070, Subiaco East WA 6008), or through your nominated Financial Institution. Notice given to us should be received by us at least 5 business days prior to the due date.
2. You may stop payment of a monthly donation by giving written notice directly to us (PO Box 8070, Subiaco East WA 6008), or through your nominated Financial Institution. Notice given to us should be received by us at least 5 business days prior to the due date.
3. You may request a change to the donation amount and/or frequency of the monthly donations by contacting us on (08) 9380 9633 and advising your requirements no less than 5 business days prior to the due date.
4. Where you consider that a drawing has been initiated incorrectly (outside the monthly donation to Australian Wildlife Conservancy arrangements) you may take the matter up directly with us on (08) 9380 9633, or lodge a Direct Debit Claim through your nominated Financial Institution.

Your commitment to us, Your responsibilities:

1. It is your responsibility to ensure that sufficient funds are available in the nominated account to meet a drawing on its due date. (You may be charged a fee by your Financial Institution if the account details are incorrect or there are insufficient funds in the nominated account when we attempt to deduct donations.)
2. It is your responsibility to ensure that the authorisation given to draw on the nominated account, is identical to the account signing instruction held by the Financial Institution where your account is based.
3. It is your responsibility to advise us if the account nominated for transactions with the Australian Wildlife Conservancy Fund is transferred or closed.
4. It is your responsibility to arrange a suitable alternative payment method with us if the Australian Wildlife Conservancy Fund drawing arrangements are cancelled either by yourselves or by your nominated Financial Institution.
5. Please enquire with your Financial Institution if you are uncertain whether direct debit functions are available on your account. (You may be charged a fee by your Financial Institutionif the direct debit facility is not available on your account.)

australian wildlife conservancy

Creative Nature 15272 - News 15

Please post this form to:

australian wildlife conservancy - Reply Paid 8070 Subiaco East WA 6008 Phone: 08 9380 9633 www.australianwildlife.org ABN 36 068 572 556

WILD302588