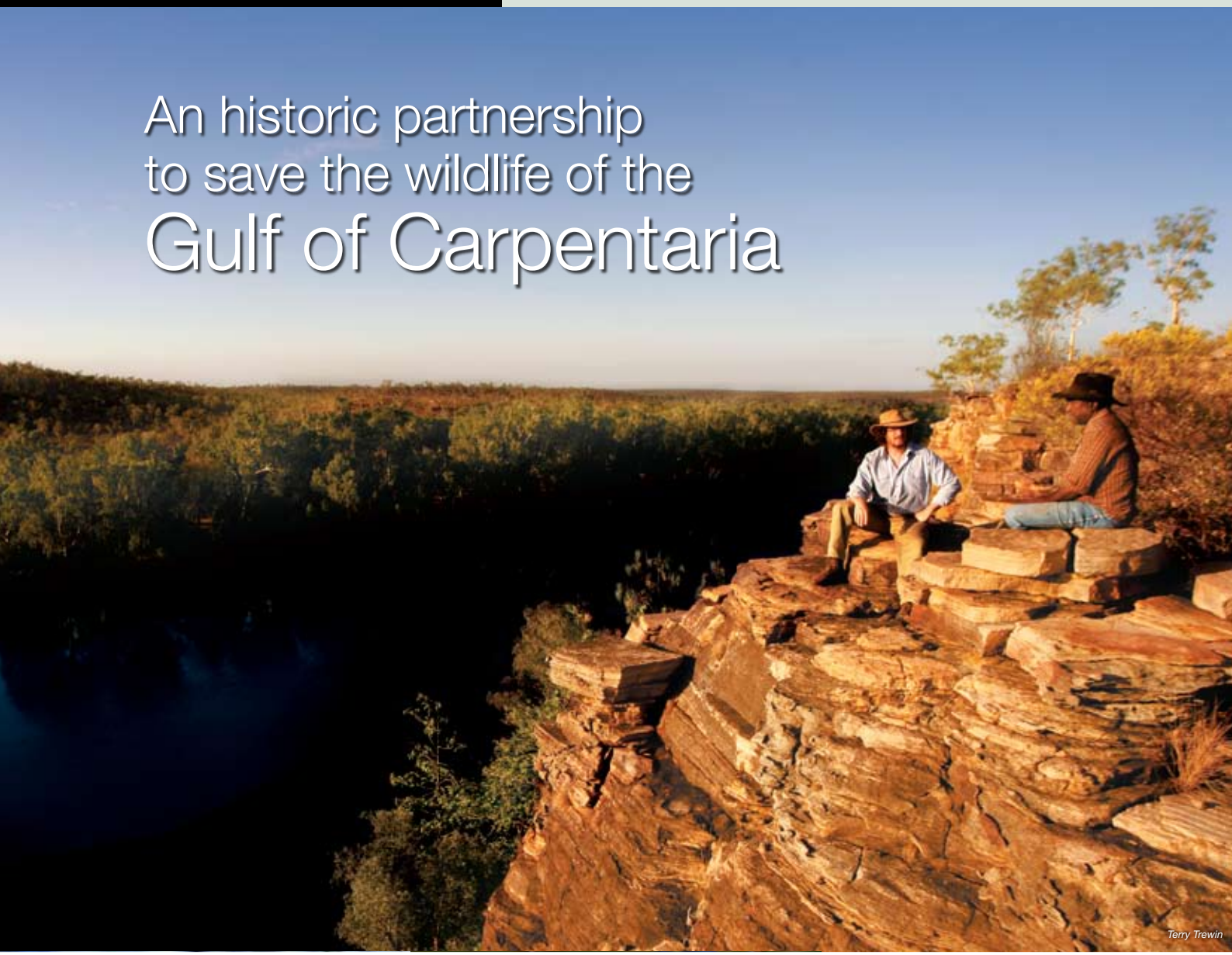
newsletter of australian wildlife conservancy

wildlife matters

australian wildlife conservancy

SUMMER 2008/09

An historic partnership to save the wildlife of the Gulf of Carpentaria



Terry Trewin

P. Rothlisberg

S. Murphy

Lochman Transparencies

saving australia's threatened wildlife


Pictograph

Welcome to the Summer 2008 edition of *Wildlife Matters*. At a time when global financial markets are in turmoil, I am pleased to provide some very good news about one of your investments. Australian Wildlife Conservancy (AWC) continues to deliver very strong positive returns. Of course, the value of our assets is not measured in dollars but in terms of the number of native wildlife species and habitats that are effectively conserved on AWC sanctuaries. In this respect, AWC is a market leader, protecting more species of birds, mammals, reptiles and amphibians, and their habitats, than any other non-government organisation in Australia.

Over the last 12 months, we have increased the number of species and habitats that are protected by AWC through the acquisition of key sanctuaries in central and northern Australia. However, most importantly, we have continued to deliver *effective conservation* for species on our sanctuaries through the implementation of practical, on-ground programs targeting feral animals, fire management and other threatening processes. Populations of key species such as the Bridled Nailtail Wallaby are meeting targets (ie, the populations are stable or increasing). Just as importantly, we have delivered these ecological returns in a cost-effective manner.

There are several key elements of AWC's business model which underpin our ongoing performance:

- **Around 80% of our staff are based in the field**. This has enabled us to roll-out programs dealing with fire management and feral animal control at a scale that is unique within the non-government sector. More information on our land management programs are set out in the following pages.
- **AWC invests heavily in field-based science.** We have a large number of scientists and students based in the field, seeking to fill the "information gaps" that currently limit the effectiveness of all land managers. This is a critical investment by AWC – by helping to find better ways to manage land, our investment will provide a more secure future for Australia's wildlife, as well as a more productive future for pastoralists and other land managers.
- **AWC uses resources efficiently:** A high proportion of our operating expenditure (over 80%) is directed to conservation programs. This is significantly higher than other comparable organisations. Similarly, our cost of fundraising is lower than other comparable organisations.

As economic conditions tighten, AWC recognises the importance of ensuring that scarce resources are used as effectively as possible. With this in mind, the Pungalina-Seven Emu project (see pages 4-9) is an example of AWC structuring a deal in an innovative manner to secure a great environmental outcome at a reduced cost.

AWC set out to find a project that would capture an ecological gradient from the Gulf of Carpentaria coast to the sandstone escarpment of the interior. We achieved this by combining the acquisition of Pungalina (in the interior) with a long-term sublease over an adjacent section of Seven Emu (including 55 kilometres of coastline). The combined Pungalina-Seven Emu Wildlife Sanctuary contains all of the mammals and birds expected in this region, with the exception of a single species of mammal and a single bird species.

This is an example of AWC's innovation: the sublease over Seven Emu is the first time a private organisation has subleased Aboriginal-owned land for conservation. At a combined investment of $5.25 million, it was also significantly less expensive than the alternative options within the region. By saving on the cost of acquisition, AWC hopes to be able to invest more in on-ground management at Pungalina-Seven Emu.

I hope you enjoy reading about the Pungalina-Seven Emu project, as well as the updates on our programs at other sanctuaries across Australia. The extent of our activity around Australia is, I believe, a measure of the dedication and commitment of our staff team.

Finally, I wish to thank all of our donors, volunteers and other supporters. The success we have achieved to date is a direct result of your generosity. I am confident that, with your continued support, AWC will remain a "blue chip" investment helping to provide a secure future for Australia's wildlife.

Merry Christmas

Atticus Fleming
Chief Executive

PS AWC is pleased to offer a special Christmas gift: sponsor the acquisition and management of an area of Pungalina-Seven Emu on behalf of a friend or family member for only $35 per hectare! See page 9 for details.

australian wildlife conservancy

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 2.5 million hectares (6.2 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 photos (main): Atticus Fleming and Frank Shadforth on an escarpment overlooking the Calvert River, Pungalina.
Animals (L-R): Dingo; Purple-crowned Fairy-wren; Spectacled Hare Wallaby

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Northern Australian update

Planigales at Piccaninny Plains

Wayne Lawler

The implementation of our northern Australian strategy has been a high priority for AWC in 2008. As part of this process, we have carried out a range of on-ground management programs at our sanctuaries across the north, as well as completing the acquistion of Piccaninny Plains and Marion Downs

Marion Downs

Marion Downs covers over 280,000 hectares of tropical savanna and sandstone escarpment country. Features of the property include the Phillips Range and spectacular rivers and streams that carve deep gorges through the Kimberley landscape.

Lindsay Malay, a member of the local indigenous community, has joined the AWC staff team, based at Marion Downs. Together with a wealth of practical experience, Lindsay also brings strong local knowledge to his new role implementing the land management programs at Marion Downs.

Since completing the acquisition of Marion Downs, AWC has undertaken a range of priority management tasks:

- Targeted biological surveys have confirmed the presence of the endangered Northern Quoll, as well as the Northern Brown Bandicoot (which has elsewhere declined across northern Australia).
- Wildfire suppression has been required on several occasions to limit the impact of late season fires.
- Infrastructure maintenance, including fencing, is laying the groundwork for destocking of most of the property to begin in the next dry season.

Piccaninny Plains

Protecting rare tropical grasslands and a network of spectacular wetlands, Piccaninny Plains covers over 170,000 hectares of northern Cape York. It is a region of extraordinary biological significance, strongly influenced by its previous connections to New Guinea. The AWC team at Piccaninny Plains has been very active:

- Several hundred feral cattle have been mustered, ready for sale early in the next dry season.
- 1700 feral horses have been culled.
- A new boundary fence is being constructed to reduce the level of re-invasion by cattle and feral horses.

AWC scientists and volunteers carried out a biological survey of the major habitats on Piccaninny, incorporating over 3,800 trap nights and many hours of bird surveys. The survey team recorded a high number of rare and endemic species, including several important range extensions: see page 25 for more information.

Thank you to all AWC supporters who have helped with the acquisition and management of Marion Downs and Piccaninny Plains. We could not have completed these acquisitions without your generous support. We also acknowledge the special contribution we have received from the following key partners:

- The Australian Government has provided a grant of $1.8 million for the acquisition of Marion Downs. The Nature Conservancy is also providing substantial assistance for Marion Downs.
- The acquisition of Piccaninny Plains involves one of our key partners, WildlifeLink-The Tony and Lisette Lewis Foundation. A generous grant is also being provided to AWC through the Wild Australia program, a joint initiative of Pew Environment Group and The Nature Conservancy.

AWC is very grateful for the assistance provided by our supporters around Australia and from our key partners. Together, we are making great progress toward the effective conservation of wildlife and habitats in northern Australia.

AWC staff members Lindsay Malay and Richard Kingswood at Marion Downs

Tony Fleming

Pungalina-Seven Emu project

A stronghold for wildlife in the Gulf of Carpentaria

Australian Wildlife Conservancy has secured an opportunity to establish the first private nature reserve in the Gulf of Carpentaria. The Pungalina-Seven Emu Wildlife Sanctuary will protect an area of outstanding conservation significance. It will also represent an historic partnership between AWC and an indigenous landholder, creating an exciting new model for conservation on indigenous-owned pastoral land.

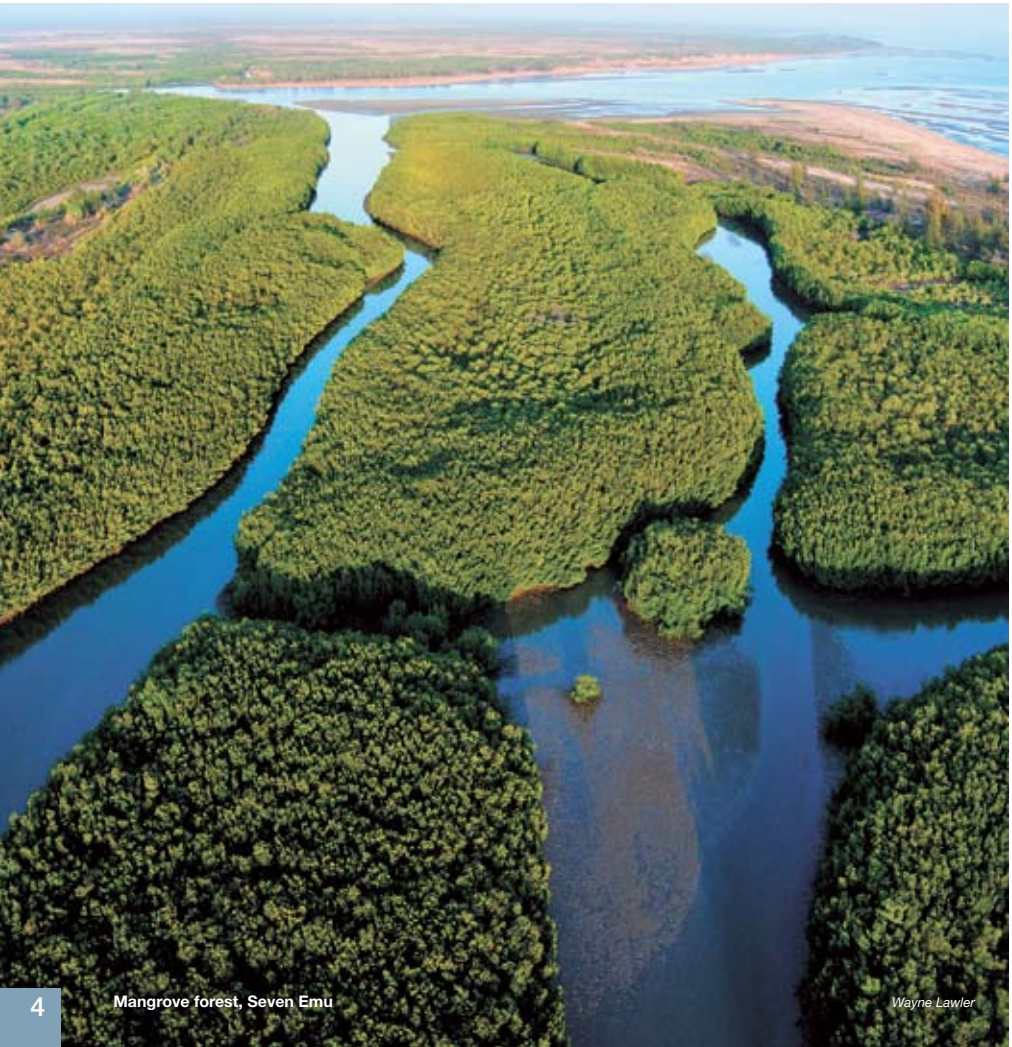
Pungalina is perched on the edge of a rugged sandstone plateau, overlooking the vast coastal plains of Seven Emu. The two properties are intimately connected by the powerful Calvert River, which has shaped the Pungalina-Seven Emu landscape for millennia. On Pungalina, the river has carved a network of deep gorges and dramatic sandstone escarpments. Here, the monsoon rains are collected from across the tropical savanna before tumbling off the plateau and through Seven Emu to meet the salt water of the Gulf of Carpentaria. Along the way, the river traces a remarkable ecological gradient which supports a diversity of wildlife, including many rare and declining species.

Covering a combined area of 306,000 hectares (750,000 acres), Pungalina and Seven Emu encompass:

- Over 55 kilometres of pristine coastline.
- More than 100 kilometres of the nationally significant Calvert River.
- Over 325 species of birds, mammals, reptiles and frogs, including a suite of threatened species.
- A diversity of ecosystems including perched wetlands, coastal rainforest, vast eucalypt woodlands, bubbling thermal springs, mangroves and extensive riparian forest.

Pungalina and Seven Emu are centrally located within the Gulf Region. This Region links the Top End and Cape York Peninsula, playing a vital role in connecting the landscape of northern Australia. However, there has been little investment in conservation in the Gulf and its wildlife is disappearing. The impact of feral animals, weeds and altered fire regimes has been severe.

Pungalina and Seven Emu have largely escaped the impact of these threats and, with effective land management, will provide a vital stronghold for the wildlife of the Gulf of Carpentaria.



Mangrove forest, Seven Emu *Wayne Lawler*

A remote tributary of the Calvert River, Pungalina *Ecopix*

An historic partnership

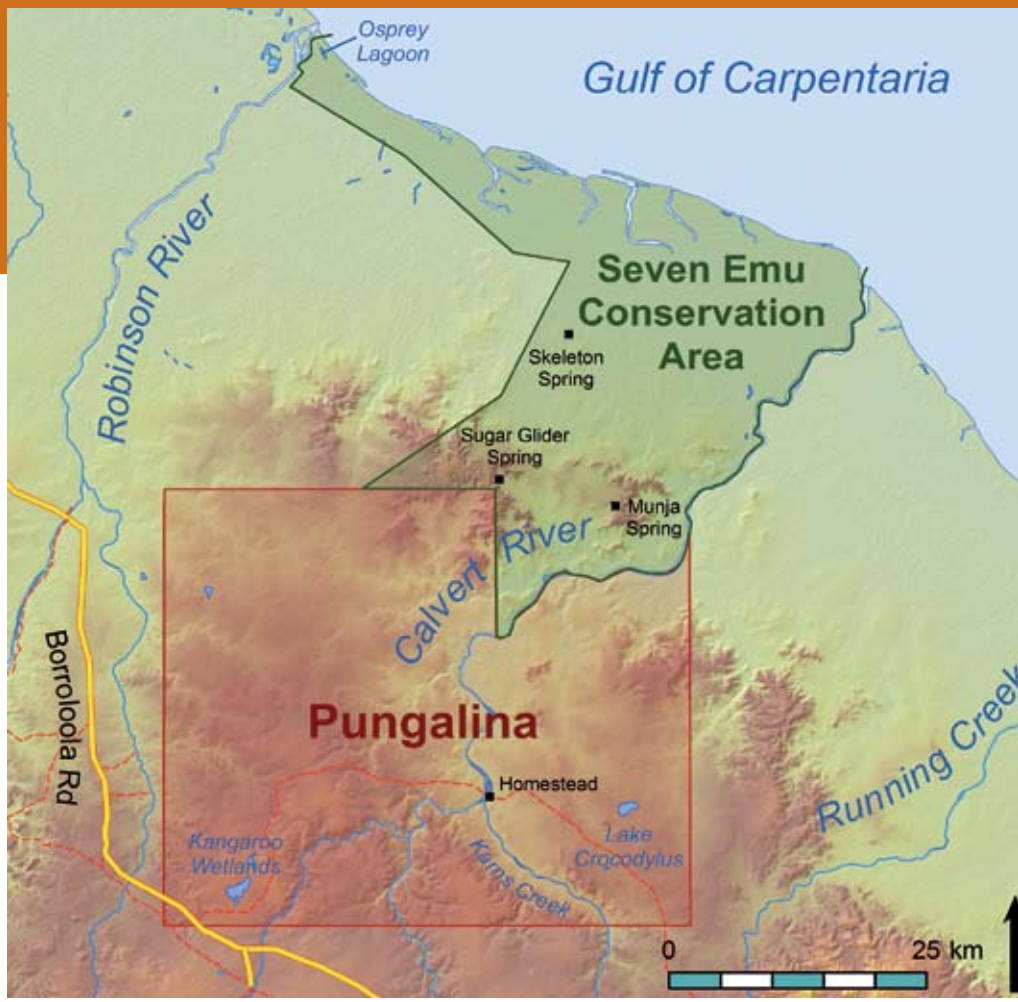
The establishment of the Pungalina-Seven Emu Wildlife Sanctuary involves an historic partnership between AWC and an indigenous landholder, Frank Shadforth, and his family.

Pungalina, which covers 194,000 hectares, is being acquired outright by AWC.

Seven Emu is owned by Frank Shadforth, a Garawa man. AWC has entered into a partnership with Frank Shadforth under which 111,000 hectares of Seven Emu will be subleased to AWC for conservation.

Seven Emu was acquired by Frank's father, Willie Shadforth, in 1953. Willie Shadforth was the first indigenous man to acquire a pastoral lease in Australia. Frank's son, Clarrie, and his daughter, Marissa, work with Frank in managing Seven Emu.

AWC and Frank Shadforth have created an important new model for conservation on indigenous-owned pastoral land. The Seven Emu project represents the first time in Australia's history that a private conservation organisation has subleased an area of indigenous land for conservation. The partnership extends to on-ground management at Seven Emu, where AWC will be working closely with Frank and his family.



This new model, which provides for the conservation value of indigenous land to be realised through payment of an "ecosystem rental", has the potential to deliver substantial benefits for conservation across northern and central Australia, as well as significant socio-economic benefits for indigenous communities.

Seven Emu is the first example of this model being applied in practice, generating a return for the Shadforth family and securing a vital area for conservation.

At Pungalina and Seven Emu, our shared vision is to ensure the effective conservation of both properties, providing a secure refuge for the wildlife of northern Australia.

Frank Shadforth and AWC Chief Executive, Atticus Fleming

Wayne Lawler

Pungalina - Seven Emu

Showcasing the ecosystems of the Gulf Region

Pungalina and Seven Emu combine to capture a broad range of Gulf region ecosystems. The beaches along the Seven Emu coast are guarded by she-oaks, while strips of mangrove forest hug the estuaries and waterways and tidal flats support an array of waders.

A series of parallel sand dunes is lined with coastal monsoon rainforest, a rich and rare habitat type which is in remarkably good condition on Seven Emu. Vetiver grasslands, salt flats and a network of freshwater and brackish lagoons contribute to making the 55 kilometres of coastal strip on Seven Emu biologically and visually outstanding.

The coastal plains support a variety of different woodlands. Belts of Northern Cypress Pine alternate with tall Darwin Stringybark forests as well as bloodwood and box woodlands. Further inland, ancient sandstone rises closer to the surface and the woodlands become more open. In places, especially around the edge of the plateau near the boundary of Pungalina and Seven Emu, the sandstone breaks through as heavily weathered and gnarled outcrops studded by Cabbage Palms and Cycads, as well as eucalypts. Perched wetlands on top of the plateau support concentric rings of waterplants, Coolibahs, Northern Swamp Box, and paperbarks.

This ecosystem gradient, from salt to ancient sandstone, sea-level to uplands, is connected by the mighty Calvert River and its tributaries. The Calvert River cuts its way through the sandstone in a series of deep gorges, creating pockets of dry rainforest and tall riparian forests of River Red Gums and more paperbarks, mixed with Pandanus Palms and Freshwater Mangroves.

Pandanus and eucalypt woodlands *Ecopix*

Escarpment overlooking the Calvert River, Pungalina *Ecopix*

A refuge for the wildlife of the Gulf

The diversity of habitats on Pungalina and Seven Emu is vitally important for wildlife. In addition, unlike other properties in the region, Pungalina and Seven Emu have largely escaped the impacts of weeds and grazing by introduced herbivores, making them an important refuge for many rare species.

The new Pungalina-Seven Emu Wildlife Sanctuary will protect nearly 200 bird species, over 35 mammal species and more than 105 reptiles and amphibians. This species inventory does not include pelagic seabirds like boobies, most terns, and frigate birds that are likely to visit the shores of Seven Emu regularly.

Pungalina and Seven Emu provide refuge for a range of threatened species including the Gulf Snapping Turtle, the Freshwater Sawfish, the Beach Thick-knee and the Red Goshawk, as well as sea turtles. The properties also protect Northern Brown Bandicoots, Spectacled Hare Wallabies, Antilopine Wallaroos and other species which, while not yet on the threatened species list, have declined over large parts of northern Australia. The Purple-crowned Fairy-wren and the Buff-sided Robin are just two of the iconic birds that adorn the riverside habitats on Pungalina-Seven Emu.

The transition from coastal waters to sandstone uplands is mirrored by changes in the resident wildlife community. Mangrove Robins at the coast are replaced by Buff-sided Robins in the freshwater springs along the Calvert River, while crab-eating Collared Kingfishers give way to Red-backed Kingfishers in the savannas. Red-headed Honeyeaters in the coastal mangroves have their place taken by a bevy of other honeyeaters in the woodlands, including Banded, White-throated and Grey-fronted Honeyeaters. It is a birdwatcher's paradise.

Pungalina and Seven Emu are home to three locally endemic reptile species: the endangered Gulf Snapping Turtle and lesser known species, the Carpentarian Ctenotus and the Borroloola Dtella.

Green Turtle — *Lochman Transparencies*

Buff-sided Robin — *Wayne Lawler*

Antilopine Wallaroo — *Ecopix*

Pungalina - Seven Emu

Management priorities

The impact of feral animals and weeds, changed fire regimes and cattle grazing across most of the Gulf Region has been severe. Pungalina and Seven Emu are rare exceptions to this rule, having largely escaped the effect of grazing and weeds. There is an urgent need for a project, like Pungalina-Seven Emu, that will showcase effective land management and act as a catalyst to help improve management across the region.

The immediate implementation of such active land management will be critically important. The wildlife and habitats on Pungalina-Seven Emu will be secure only when threats such as fire, feral animals and weeds are effectively abated.

AWC is unique among non-government organisations in that we have extensive experience in delivering land management in northern Australia. Frank Shadforth and his family are intimately familiar with Seven Emu and have a long history of managing the property. Together, our priorities at Pungalina and Seven Emu will include:

- Establishing and maintaining infrastructure (field operations base; solar power; fencing; roads) and assets (grader; vehicles; conservation equipment).
- Active fire management must be put in place: strategic burning from the ground and by helicopter can prevent extensive wildfires on Pungalina-Seven Emu.
- Feral animals must be controlled: horses, donkeys, pigs, feral cats and even buffalos have the potential to devastate the wildlife of Pungalina-Seven Emu.
- There are few weeds on Pungalina-Seven Emu, which means it is important to establish and implement measures that will prevent the establishment of invasive species.
- AWC will conduct a biological inventory and map habitats. Scientific research will help unlock the secrets to survival for the wildlife of northern Australia, while a rigorous monitoring program will measure the ecological condition of the properties over time.

AWC has extensive fire management experience in tropical savannas

Nick Rains

Biological surveys will be a priority management action

Wayne Lawler

Sea turtles come ashore on Seven Emu

Wayne Lawler

We need your help

"A lot of things are disappearing very fast. There is a bird I used to see in this country when I was small – a woodpecker. In the 1970s it disappeared. Same with another little kangaroo. It's always in the back of my mind."

Frank Shadforth

We need your help to protect Pungalina and Seven Emu and to establish an important new model for conservation on indigenous land. This is a unique opportunity to make a real difference in the heart of one of the world's last great natural areas.

A gift of $350 will acquire and protect 10 hectares (25 acres) along the gradient from the Seven Emu coast to the sandstone uplands of Pungalina.

The total cost to AWC of acquiring Pungalina and securing a long-term lease over Seven Emu is $5.25 million.

In addition, AWC must raise funds for management at Pungalina-Seven Emu:

- Approximately $1.5 million in set-up costs (fencing, field operations base; field research quarters etc); and
- Approximately $4 million for a perpetual management fund, which will generate 50% of the estimated $400,000 required every year for operational costs at Pungalina-Seven Emu.

AWC and Frank Shadforth and his family face a great challenge in protecting Pungalina and Seven Emu. We hope you will join us in helping to save these stunning places and their threatened wildlife.

Thank you to the Australian Government, which has provided $2.1 million to assist with the acquisition of Pungalina, and The Nature Conservancy, which is also providing generous support.

The perfect gift for Christmas: a hectare of Pungalina-Seven Emu

Are you looking for the perfect gift for family and friends this Christmas? A special gift that that will help save a spectacular part of northern Australia and its threatened wildlife? As a gift to a friend or family member, make a tax deductible donation to help protect a hectare or more of Pungalina-Seven Emu. You will receive by email a special Christmas certificate to print and include under the tree (or we can email it direct to the gift recipient). ***At $35 per hectare, this is a Christmas gift that will last forever.***

To make a donation: fill in the form with this newsletter (page 28); call 08 9380 9633 or visit www.australianwildlife.org

AWC: a new model for conservatio

AWC Chief Executive, Atticus Fleming, discusses the role of AWC in developing a new model for conservation in Australia.

I am often asked about the role of Australian Wildlife Conservancy (AWC) within the overall conservation sector and, in particular, about the extent to which we are different to government agencies and other non-government organisations.

AWC was founded by Martin Copley because he recognised the need for additional action to address Australia's extinction crisis. Australia has the worst mammal extinction rate in the world and literally thousands of animal and plant species and ecosystems are on the endangered list.

Clearly, there are immense challenges involved in saving our biodiversity. To meet these challenges, Australia will need both a strong public sector and an increasingly significant contribution from the private (non-profit) sector. Greater collaboration between the private and public sectors will be required.

Increased accountability for all organisations, and some healthy competition, is also important. Increased accountability will ensure that investors (both public and private) can direct funds to projects that deliver the highest biodiversity returns. Healthy competition will encourage organisations to innovate and continually improve their performance.

Above all, we need to recognise that "business as usual" in the conservation sector will result in many more extinctions in Australia. It is therefore time to challenge the traditional way of delivering conservation; to look at new roles for the public sector and the private sector, as well as new partnership models; and to look at more innovative ways of doing conservation.

In short, we need a new and more effective model for conservation in Australia. AWC is at the cutting edge of efforts to design and implement such a model.

What is the role of AWC?

AWC's mission is the effective conservation of all Australian animal species and the habitats in which they live. In order to achieve this mission, we undertake the following activities:

- **AWC establishes wildlife sanctuaries** by acquiring land and also by working in partnership with other landholders. Our properties become catalysts for broader regional initiatives (see the article on our EcoFire project on pages 15-18) and many of our partnerships reflect a high level of innovation (see the Seven Emus partnership on pages 4-9).
- **AWC implements practical, on-ground land management** including feral animal control, weed control, fire management and translocations of threatened wildlife. As you will read throughout this edition of *Wildlife Matters*, we are breaking new ground in relation to the delivery of land management across Australia.
- **AWC undertakes field-based scientific research** designed to inform the development of our land management strategies, and to measure the effectiveness of our implementation of those strategies. AWC is increasingly recognised as a key player in applied conservation science.
- **AWC implements public education** programs to raise awareness of conservation issues. Our programs at places like Mornington, Yookamurra and Karakamia offer a unique visitor experience.

What has been the contribution of AWC to date?

Although only a relatively young organisation, AWC's contribution to conservation has been very significant and we are making great progress toward the achievement of our mission.

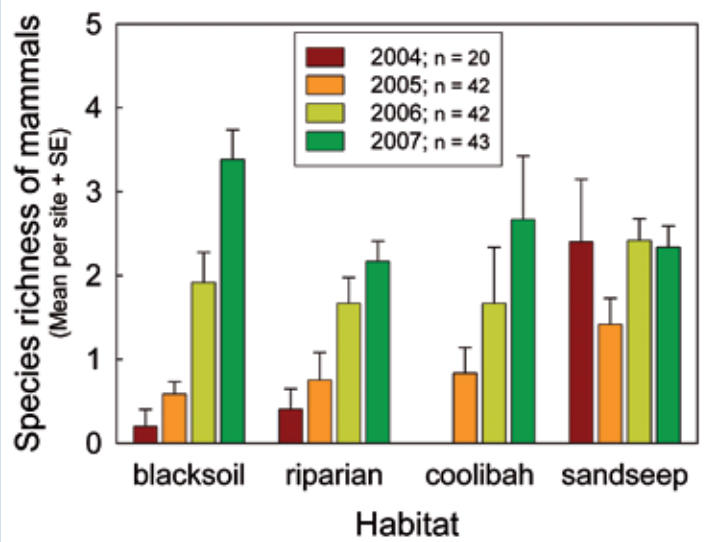
- *AWC owns more land for conservation than any other non-government organisation in Australia.* AWC now manages 20 properties, covering a total of 2.5 million hectares (6.2 million acres).
- *AWC protects more species of mammals and birds than any other non-government organisation in Australia.*
  - More than 74% of all Australian bird species are found on one or more AWC reserves.
  - Over 68% of all Australian mammal species are found on one or more AWC reserves.
- *AWC protects more ecosystems than any other non-government organisation in Australia.*

How is AWC different to other organisations involved in protected area management?

AWC's particular expertise is focused on:

- The active management of large, remote areas (for example, our properties in the Kimberley, near Arnhem Land, in the Gulf, in Cape York and in the central deserts).
- The *restoration* of wildlife populations, including through the creation of feral predator-free areas and the reintroduction of regionally extinct species.
- High quality applied conservation science, tackling a range of issues including improving our understanding of threatening processes (fire, feral animals, etc) and gathering information on the ecology of threatened species.

There are four key factors that distinguish AWC from other conservation organisations (public and private) and that ensure we are well-equipped to discharge the above roles.



The average number of small mammal species at permanent monitoring sites on Mornington Wildlife Sanctuary has increased in most habitats since the removal of stock and the control of fire.

n in Australia

Development of the AWC model began at Karakamia, our first sanctuary

Richard Woldendorp

1. AWC invests a greater proportion of our resources in the delivery of on-ground conservation (as opposed to administration and fundraising)

- Around 80% of AWC staff are based in the field. This is a much higher proportion than any other comparable organisation. It reflects the fact that we ensure our remote properties are adequately staffed.
- Over 80% of AWC's operational expenditure (ie, not taking into account capital costs such as land acquisition) is incurred on conservation programs. Again, this is a higher proportion than other comparable organisations, reflecting the priority that we give to land management programs such as fire management and feral animal control.
- Our cost of fundraising is lower than other comparable organisations.

2. AWC's land management programs are being rolled out at a scale that is unique within the non-government sector

- AWC manages more feral predator-free land than any other organisation on mainland Australia (government or non-government). For example, Scotia Sanctuary in western NSW contains the largest feral predator-free area on mainland Australia.
- AWC has conducted over 70 trans-locations of threatened and declining mammals. AWC is a leader (nationally and globally) in the field of reintroductions: in fact, our level of experience is unparalleled within the non-government sector in Australia.
- In relation to fire management, AWC recently conducted fire management across 14 properties in the Kimberley covering 5 million hectares. It is the first time a non-government conservation organisation has conducted fire management at this scale.

3. AWC invests heavily in field-based science and we ensure that our science program is tightly integrated with our land management program

- AWC has established a major field research centre at Mornington Sanctuary. This is the only research centre of its kind in the Kimberley, and currently hosts scientists from around Australia and the world. A second field research centre has now been established at Scotia in far-western NSW.
- In total, AWC has 17 scientists working across our sanctuaries on key issues affecting biodiversity conservation. The science team helps in the development of land management strategies and audits the success of their implementation.

4. AWC focuses on outcomes

- AWC operates in a business-like manner, with a focus on outcomes rather than process.
- Our success at a property like Mornington is therefore measured by reference to informative indicators, such as the number of small mammal species that are present. Across our sanctuaries, populations of key species such as Bilbies and Purple-crowned Fairy-wrens are increasing.
- Ultimately, our focus on outcomes and our efficient use of resources means that every dollar donated to AWC generates a very high return for Australia's wildlife.

Our practical approach to conservation, and our recent achievements, are highlighted in the following pages.

A Pale Field Rat captured at a monitoring site at Mornington

Tegan May

Feral animal control

AWC invests a higher proportion of available resources in on-ground land management than any other conservation organisation in Australia. Much of our investment is directed to the control of feral animals, which represent a grave threat to the survival of native wildlife. The paragraphs below summarise our overall approach to feral animal control, and provide an update on implementation at AWC sanctuaries.

Since the 1800s, hordes of rabbits, sheep, goats and larger herbivores have swept across our continent, competing for vegetation and other resources, and blazing a trail for feral cats and foxes. The effect on Australia's native wildlife has been devastating. For example, in the arid zones of central and southern Australia, the majority of mammal species between the sizes of a large rodent and a small wallaby are either extinct or threatened with extinction.

Feral animals are now among the most abundant species in many Australian landscapes. For example, it is estimated that Australia is home to:

- 40 million rabbits (in Victoria alone)
- 1 million camels
- 18 million cats (each of which consumes the equivalent of about 800 pygmy possums per year.)

Active and sustained control of these invasive species is essential if native wildlife is to survive. **A protected area without an active feral animal control program is potentially a "marsupial ghost town"**. However, feral animal control is not an easy task – invasive species are, by definition, exceptionally good at surviving, breeding and dispersing, and many are inherently difficult to trap or kill.

To meet this challenge, AWC has adopted a holistic approach to feral animal control which incorporates:

- **implementation of on-ground control programs that include mustering, trapping, shooting and baiting a range of feral animals;**
- **development of regional strategies which involve working with neighbours and other landholders to implement integrated, cross-boundary programs;**
- **implementation of rigorous monitoring programs to measure the success of on-ground activity and to inform the ongoing review of program design; and**
- **conduct of strategic research to continually improve the techniques and methodologies we employ to control feral animals.**

Our leadership in the area of feral animal control has been recognised by our role as an active participant within the Invasive Animals Co-operative Research Centre (CRC).

On-ground feral animal control

There is no substitute for dedicated, on-ground feral animal control. Any failure to implement effective feral animal control at a property is likely to result in a steady decline in its ecological condition as feral animals damage habitats and destroy wildlife.

AWC's objective at each sanctuary is to reduce the population of feral animals to a level where their impacts are ecologically insignificant. In limited cases (such as the cane toad), there is currently no feasible method for achieving this. In all other cases, there is a range of techniques that we employ to remove ferals. However, determining the "threshold" to which a feral animal population needs to be reduced in order to ensure its impact is ecologically insignificant remains an ongoing challenge.

In some cases, complete eradication is necessary. For example, many small-medium sized mammals - such as the Mala and the Greater Stick-nest Rat - will survive only in the complete absence of cats and foxes. In order to protect and restore populations of these mammals, AWC has established feral predator-free areas on an offshore island (Faure Island) and within several fenced mainland areas (Scotia, Yookamurra and Karakamia). In these areas, the threshold population of foxes and cats is zero. Employing this strategy, AWC now manages more feral predator-free land on mainland Australia than any other organisation. These areas are also free of feral herbivores including rabbits and goats.

Establishing a feral predator-free area requires a significant investment of resources: feral-proof fences must be constructed and

Buffalo and feral cattle yarded, ready for removal at Wongalara

Melissa Whatley

Feral exclusion fence, Scotia

Wayne Lawler

Feral donkeys

Jo Heathcote

staff time invested in the removal of rabbits, cats and foxes through baiting, trapping and shooting. It took Tony Cathcart, our feral animal control officer at Scotia, more than 6 months to eradicate the very last feral cat within the 4,000 hectare "Stage 2" fenced area. However, the return on investment is extremely high: AWC's feral free areas are critical to the survival of several highly threatened mammals including the Woylie, Bridled Nailtail Wallaby, Boodie, Western Barred Bandicoot and the Queensland Bilby (see the article on Translocations on page 20).

In cases where complete eradication is not the objective, we are taking action to reduce feral animal populations to levels at which their impacts are ecologically insignificant. We are in the process of defining the relevant "thresholds" for feral animal species at each of our sanctuaries. In the meantime, AWC staff are forging ahead with dedicated action to reduce the impacts of each feral animal. Examples include:

- 70,000 baits for foxes and cats have been laid each year for the past three years at Mt Gibson (which is unfenced).
- Since 2006, just under 2,000 feral goats have been shot at Buckaringa by AWC staff and the Sporting Shooters Association of SA, helping to protect the threatened Yellow-footed Rock-wallaby.
- Over 200 buffalo have been trapped and removed from Wongalara in the past 4 months alone.
- Approximately 2,000 cattle, 250 horses and 200 donkeys have been removed from 65,000 hectares of Mornington in recent years. Within this destocked area, an ongoing control program maintains numbers in this area to less than 100 animals, so that impacts are insignificant.

Our programs are carefully designed to take into account knowledge of the ecology and behaviour of the target species. For example, at Wongalara we muster buffalo late in the dry season when they are concentrated on the diminishing waterholes. Camels at Newhaven are shot during the winter, when rutting males keep females together in large groups, and when access to alternative bores is prevented.

Implementing regional programs

AWC aims to play a key role in the development and implementation of regional strategies which involve working with neighbours and other landholders to implement integrated, cross-boundary programs. We do this for two reasons: (1) we aim to ensure our sanctuaries are catalysts for broader conservation efforts across the regions in which we operate; (2) it reduces the extent to which feral animals "reinvade" AWC sanctuaries and so it helps maintain populations below ecologically significant levels.

Examples of AWC's regional approach include:

- In the Flinders Ranges, AWC staff and volunteers bury baits for foxes at least every two months at Buckaringa, and also in a ring encircling Buckaringa on neighbouring properties.
- AWC and the WA Department of Conservation have, for several years, co-ordinated fox baiting at Paruna and adjacent National Parks.
- On an even greater scale, AWC and the various land owners and managers surrounding Scotia have recently agreed to implement a co-ordinated feral predator control program that involves synchronised baiting across 900,000 hectares.

Monitoring our ability to control feral animals

AWC is establishing monitoring programs at our sanctuaries that are designed to:

- Identify baseline populations of feral animals; and
- Measure the change in feral animal populations over time (and hence measure the effectiveness of our control programs).

(Our broader monitoring program also measures the impact of feral animals on indicator species and ecosystem processes – see pages 21-23 below.)

The data obtained from our feral animal monitoring programs is used to continually review the relevant control strategy, providing an example of AWC's adaptive management approach. Strategies will be amended when monitoring results highlight the need for change.

Our feral animal monitoring programs are typically designed to measure indicators of population size/density. For example, populations of buffalo, horses and donkeys are estimated at Wongalara by aerial surveys. At Kalamurina and Newhaven, one hundred two-hectare sandplots spread throughout the properties, as well as radial transects from bores, are surveyed to indicate changes

The last feral cat captured within the Stage 2 area of Scotia

Tony Cathcart

in camel numbers. Similarly, cat and fox activity at Scotia is monitored at permanent sandplots. Monitoring inside the fenced areas at Scotia is particularly important because reintroductions of highly threatened mammals can occur only after we confirm that the last cat and fox has been eradicated – ie, when the population of both species is zero. The graph below highlights the results of monitoring over a two year period at Scotia.

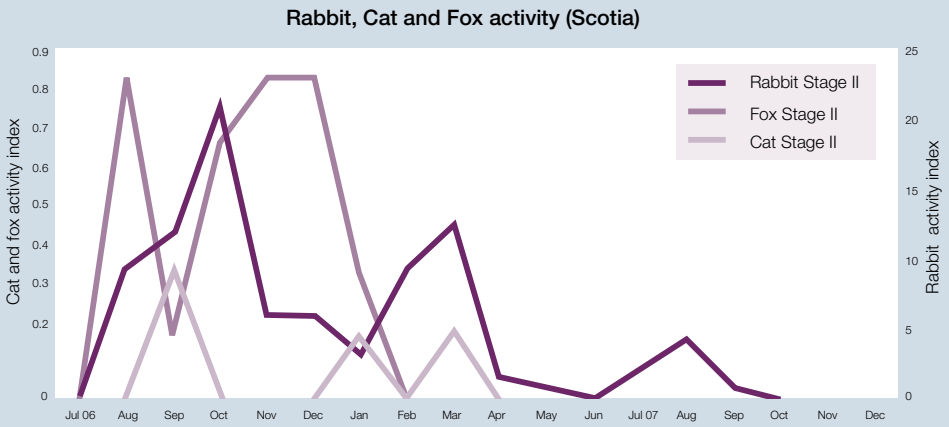
Strategic research into feral animal control

There are several key issues being addressed by AWC, often in collaboration with our research partners. Our priority to date has been to help identify new techniques to enhance the effectiveness of feral animal control programs and reduce the cost of those programs. However, we will also be seeking to identify the population level at which the impacts of a feral animal are ecologically insignificant: this will help us set our "target" for the control of that feral animal at a particular sanctuary. Some examples of recent research activity include:

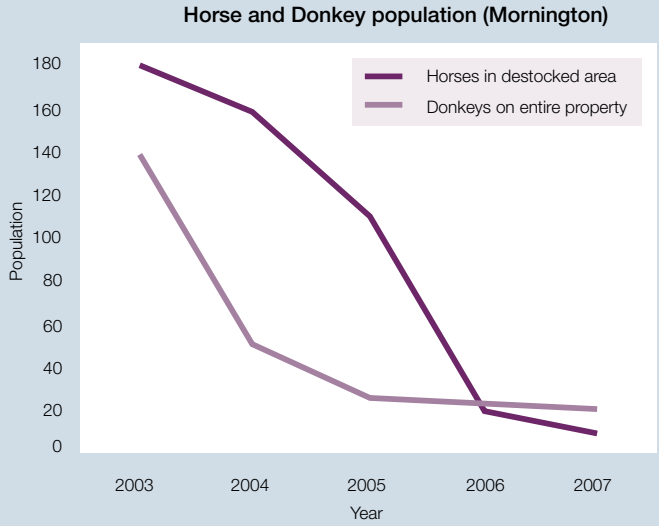
- At Wongalara, Clive McMahon (Charles Darwin University) is carrying out research that will help fine-tune our buffalo control program. By measuring the growth rates, survivorship and breeding rates of the population, Clive will be able to identify how many buffalo, and of what age and sex, we must target (as a minimum) each year to maximise population reduction. Clive is also carrying out a population genetic analysis across Arnhem Land (including Wongalara) to determine how far buffalo move; this will help us predict the likely re-invasion rate following removal of buffalo at Wongalara.
- One of the highest priorities for conservation is developing an effective way to reduce cat populations. Cats prefer to hunt live prey, and are therefore notoriously hard to bait. AWC is a key partner in trials of a new bait-delivery system (Eradicat™ – a sausage instead of the traditional lump of meat) designed to be more attractive to cats. At Mt Gibson, the impact of broadscale baiting (using Eradicat™) on cat numbers and fox numbers is being monitored in a four-year project using sandplots. Preliminary results suggest that Eradicat™ is indeed more effective at controlling cats than traditional baiting methods.

Our research priorities also include examining the potential for any proposed feral animal control program to impact on non-target species. The uptake of Eradicat™ bait by native mammals is being examined in a research project at Paruna, where the poison within the Eradicat™ sausage has been replaced by Rhodamine B, a non-toxic bio-marker that is incorporated into growing tissue, including facial whiskers. By examining the whiskers of native mammals at Paruna, we can assess whether they are eating the Eradicat™ bait.

AWC's field research is only one element of our holistic approach to feral animal control. Overall, the extent to which we invest in practical, on-ground feral animal control, informed by the best available science, makes AWC unique among non-government conservation organisations. We believe that success in defeating feral animals is essential if the tide of wildlife extinctions in Australia is to be reversed.



Regular monitoring confirms that rabbits, foxes and cats have been successfully removed from the Stage 2 fenced area (4,000 ha) at Scotia.



At Mornington, annual monitoring of horse and donkey populations is carried out.

Fire management

Along with feral animal control, fire management is a critical component of AWC's land management program. Our leadership on fire management is best illustrated by our EcoFire project in the Kimberley, where we work in collaboration with a range of partners to deliver prescribed burning across 14 properties covering more than 5 million hectares.

Fire is a naturally occurring process across almost all of Australia except the wettest rainforests. However, over the last two hundred years, fire patterns have changed significantly. This change in fire regimes has contributed to the decline in many species across a range of different habitat types.

Just as active feral animal control is essential, active fire management is also necessary to maintain and enhance the ecological condition of our landscapes. A failure to implement effective fire management represents a significant risk to habitat quality and the survival of key species.

AWC's approach to fire management incorporates the following elements:

- **Setting objectives:** AWC identifies the ecological objectives we are seeking to achieve with our fire management, based on available scientific knowledge. Our objectives may, for example, relate to: the distribution and size of unburnt patches throughout the landscape; the prevention of large, hot fires; or the protection of fire-sensitive habitats. We define indicators which will help us measure whether we are successful in achieving our objectives.
- **Development of regional strategies:** AWC aims to operate on a regional scale, co-ordinating our prescribed burning with neighbours and other landholders where possible.
- **On-ground delivery:** AWC invests significant resources in on-ground delivery of fire management using a combination of techniques including aerial incendiaries (dropped from helicopter), burning from the ground, wet season burning and so on.
- **Measuring success:** AWC uses satellite imagery and ground-truthing to monitor fire patterns and to measure our progress in achieving the specified fire management objectives.
- **Strategic research:** substantial information gaps limit our ability to effectively manage fire: many of our research programs are therefore designed to help fill those gaps (eg, the Red-backed Fairy-wren project which featured in the June 2007 edition of *Wildlife Matters*).

The expansive geographic spread of AWC sanctuaries means that we are developing expertise managing fire in habitats as diverse as the deserts of central Australia, the wet sclerophyll forests of northeast Queensland, and the savannas of northern Australia. To illustrate the range of issues involved, the following paragraphs provide an update on fire management at Mornington in the Kimberley, and Newhaven on the southern edge of the Tanami desert.

Fire management in the Kimberley

Fire patterns in the Kimberley have shifted over the past two decades towards a regime dominated by massive, intense fires in the mid-to-late dry season. Single fires can cover one million hectares, burning everything in their path. The scale and ferocity of these fires is emotionally draining – thick bands of smoke blur the horizons and the savannas blacken like a violent bruise.

However, over and above the aesthetic insult, such fires are extremely damaging to biodiversity – they kill vegetation along creeks and in wet gullies, prevent tree recruitment, reduce ground cover complexity, and elevate water and nutrient run-off, thus increasing sedimentation loads in rivers. Animals that live in the ground layer, like small mammals

Sammy Walker conducting prescribed burning near Tirralintji community, within Mornington

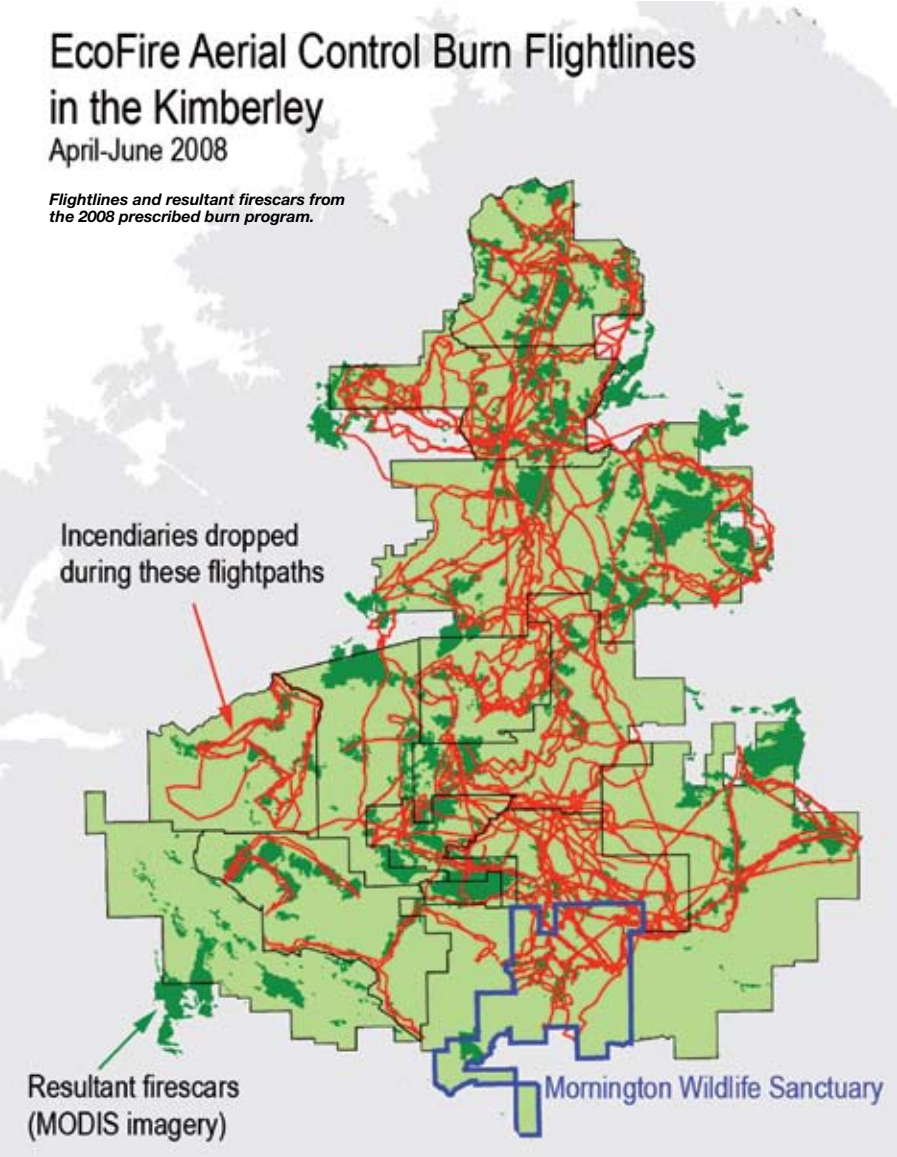
Richard Kingswood

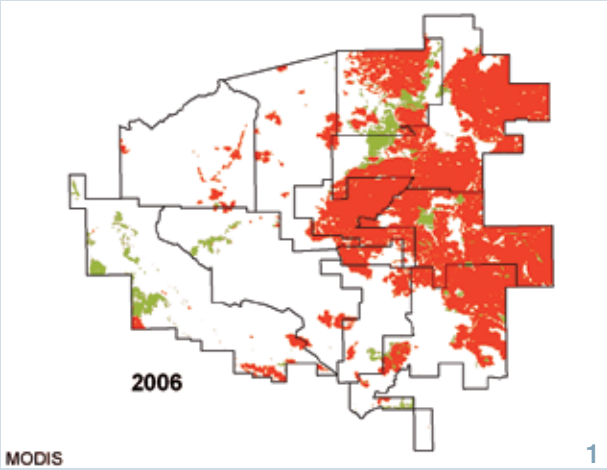
and grass-dwelling birds, are extremely disadvantaged, as are animals that rely on grass seed for food such as the Gouldian Finch (because grass seed yields are often lower following fire). Extensive fires also result in economic losses to pastoralists through loss of grass for cattle. In the longer term, frequent intense fires cause a general loss of fertility in the soil, and thus result in lower production. Finally, cultural sites are also damaged by intense fires.

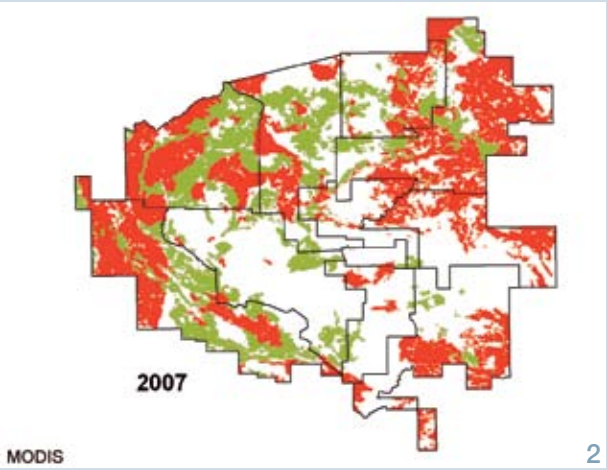
These fires dwarf single properties, and property owners and managers have therefore struggled to contain the pyretic spread when acting alone. In an ambitious project funded by Federal and State governments through the Rangelands NRM Co-ordinating Group, AWC has brought together land owners, managers, indigenous communities, government and non-government organisations with diverse interests to deliver co-ordinated, regional fire management across the central and north Kimberley; the project now involves over fourteen properties covering almost 5 million hectares.

EcoFire relies on proactive prescribed burning in the early dry season (when fires are less intense, burn patchily, and tend to go out overnight) to create firebreaks that run across property boundaries, creating multiple cells of unburnt country throughout the landscape. This lacework of breaks makes it more difficult for late dry season fires to affect large swathes of country.

The June 2007 edition of *Wildlife Matters* described the background and aims of the EcoFire project. At that time, we had just completed our first prescribed burning







The effects of a strategic prescribed burning program are demonstrated by comparing fire patterns in the year before the program (2006) with the year of the project (2007). Satellite imagery is used to map burnt areas through the year. The relatively cooler burns of the early dry season are shown in green; more intense fires in the mid to late dry season are shown in red. Following the prescribed burning in 2007, a smaller proportion of the project area burnt later in the year, and firescars were spread as smaller patches more evenly through the area.

program. Over one year later (and with two burning seasons under our belts), we are in a position to examine whether the project has been effective at changing fire patterns in a way likely to benefit wildlife.

Have fire patterns in the Kimberley changed?

Using satellite imagery, we are able to compare fire patterns pre and post the delivery of fire management by AWC and our partners as part of EcoFire. This analysis shows that at the end of the first year (ie. December 2007) fire patterns were strikingly different to previous years. Mid-to-late season wildfires (unplanned fires) were largely contained by the prescribed fire scars. As a result, wildfires made up a much smaller proportion of all fires than previous years, and the size of wildfires were also much smaller. Patches of burnt and unburnt vegetation were scattered more evenly throughout the project area, providing refuges for wildlife and grazing stock (see maps on bottom of page 16).

Based on the dramatic success of its first year and strong community support, EcoFire was expanded in 2008 to include 14 properties covering 5 million hectares.

Activity during 2008

The 2008 Regional Burn Plan was implemented during April and May. AWC staff flew approximately 24,000 km in a helicopter whilst dropping 30,000 incendiaries, with indigenous community representatives and pastoralists joining us in the chopper for the prescribed burning on their property (see map on page 16).

Incendiaries being dropped from helicopter in the central Kimberley *Jo Axford*

In addition to the prescribed burning, EcoFire has been expanded this year to include additional activities. The WA Department of Agriculture have begun monitoring the relationship between different sorts of fires, grazing pressure and pasture condition. The Kimberley Land Council has been involved in fire planning with one of the indigenous communities. The Fire and Emergency Services Authority provided training courses in on-ground fire management to project participants, especially the indigenous communities. AWC has implemented a communication program that is providing information about fire-related issues to sectors of the community.

The EcoFire project highlights key elements of AWC's approach to fire management:

- It has clear and measurable objectives, which are based on the best available science on the effects of fire in the tropical savannas.
- It is collaborative, involving a range of stakeholders and operating at a regional level, highlighting the catalytic nature of AWC activities.
- It is focused on action, not process, with the delivery of active fire management on a massive scale.
- Success is measured and reported.
- There is a strong science component, helping to continually revise objectives and strategies.

Traditional owners, Central Land Council and AWC working together on prescribed burning on the Yunkanjini Land Trust near Newhaven's northern boundary *Josef Schofield*

Fire management at Newhaven

Despite the low and erratic rainfall of our arid centre, fire patterns have still shifted towards a regime of extensive uncontrolled fires, albeit with a lower periodicity than the monsoonal north. As a result, 'old-growth' vegetation in the central deserts has become exceedingly rare.

Newhaven contains some areas of vegetation that are uniquely 'old', and thus exceptionally precious. A patch of *Acacia calcicola* in the northwest of Newhaven is not only "old-growth", it is also the only stand of its type lying within a protected area.

Newhaven's fire management is guided by a fire strategy developed by arid zone fire ecologists Peter Latz and Rachel Paltridge, and fine-tuned with annual fire planning workshops that involves several fire ecologists, Bushfires NT, and AWC staff.

A primary goal of this year's fire management has been to burn firebreaks (from the ground) around and through ten key areas of old-growth vegetation in order to protect them from destructive uncontrolled fires. The careful patch burning involved in implementing this plan has proved a painstaking task as many areas on Newhaven still have low fuel loads following extensive fires several years ago. However it is crucial to get these breaks in before the hot dry winds of summer create conditions that make almost everything highly flammable.

Some of this year's burning was carried out collaboratively with eight people from the nearby Nyirripi community, including the senior Traditional Owner for the area. Representatives from the Central Land Council (CLC) also took part. We hope the project is a first step in developing a broader partnership with Traditional Owners and the CLC in relation to regional fire management.

Although operating on a smaller scale than in the Kimberley, our fire management at Newhaven is based on similar principles: it is underpinned by clear objectives based on ecological requirements; it involves a heavy focus on active on-ground management; results are measured and reported; and it incorporates a collaborative approach with neighbours. In addition, similar to Mornington, Newhaven has a research program in place to examine the ecological effects of fire management: for example, AWC works with local ecologists and members of the Nyirripi community to examine the relationship between fire and threatened taxa (such as Mulgara and Great Desert Skink).

AWC receives WA Environment Awards

AWC and its EcoFire partners have been honoured with Western Australia's top environment award. At a special ceremony on 11 October the WA Environment Minister, the Hon Donna Faragher MLC, presented AWC and the Rangelands NRM Co-ordinating Group with the overall WA Environment Award for 2008.

Presenting the award, the Minister said the EcoFire project was "an outstanding example of strong leadership, exemplary stakeholder involvement and excellent environmental outcomes". The award was collected by representatives of AWC, the local indigenous community, the Rangelands NRM group, the WA Fire and Emergency Services Authority and the Department of Environment and Conservation (see photo).

AWC was also a joint winner of the 2008 Biodiversity Conservation Award for our restoration of endangered mammal populations on Faure Island.

Receipt of these prestigious awards is recognition of AWC's leadership in fire management, feral animal control and the translocation of endangered species.

Members of the successful EcoFire team accept their prestigious award from the WA Environment Minister

Terrace Photo

Weed control

The control of weeds is the third core element in AWC's land management strategy. AWC adopts a variety of practical and innovative approaches to removing even the most invasive weeds. As with feral animal control and fire management, we are also establishing programs to measure the effectiveness of our weed control program.

There are hundreds of weed species in Australia. Some arrived accidentally, whilst others were introduced deliberately for agriculture or ornament. Some weeds spread slowly, or not at all. Others only exploit disturbed areas, or a narrow range of habitats. However some exotic species, on arrival in a new environment, thrive and proliferate beyond all prediction and can comprehensively replace native ecosystems.

The task of removing weeds, once established, can be prohibitively expensive. AWC has therefore adopted an approach that carefully prioritises our activity based on the level of environmental risk and the feasibility of control. For example, targeting potentially threatening weeds that are newly established may be better than trying to eradicate a widespread but benign weed. Similarly, preventing new invasions by quarantining vehicles and equipment is more cost effective than controlling established weeds. The case studies below help illustrate AWC's commitment to the on-ground control of weeds.

Rubber vine control at Brooklyn Sanctuary

When AWC established Brooklyn Wildlife Sanctuary, grazing by cattle in fertile alluvial areas (and consequent removal of grassy fuel), had led to many years without fire. In the absence of fire, rubber vine (*Cryptostegia grandiflora*) had spread over 17,000 hectares and in places almost completely replaced native vegetation. AWC has used two methods to reduce rubber vine populations. Following destocking, in areas where rubber vine infestations were scattered enough to allow a build-up of grassy fuel, prescribed burning has been used very effectively to selectively kill rubber vine. Approximately 50% of the weed has been killed with this method over the past 3 years. In areas like gallery forests where fire is inappropriate (because it would damage sensitive vegetation), AWC staff cut the vines and apply herbicide. 350 hectares of riparian ecosystems have been recovered using this method.

Monitoring the effectiveness of lantana control at Mt Zero-Taravale

When AWC acquired Mt Zero-Taravale, lantana dominated the understorey of many wetter gullies, and was spilling out into the grassy woodlands. Without intervention, this noxious weed was set to spread and thicken, shading out the grass and shrub layers, and thus changing fire patterns irrevocably. However, AWC has used repeated, targeted fires to first burn the main plants, and then the suckers and regrowth that follow in the next two years. Before the control program began, the distribution, extent and density of lantana was estimated from aerial photos. Repeat aerial mapping will soon be completed and combined with ground surveys to quantify the effectiveness of our lantana control by measuring the reduction in the area occupied by lantana.

Mornington – stopping weeds from establishing

Parkinsonia aculeata is a branched spreading tree native to South America. It was introduced to Australia as a shade tree for cattle, but it outcompetes native species, chokes wetlands and creates thickets impenetrable even to cattle. It is common in parts of Queensland, but still relatively rare in the Kimberley; controlling its spread at this stage is therefore a high priority.

When conditions are suitable, Mornington staff and volunteers embark upon targeted Parkinsonia control along the Fitzroy River and its tributaries. Small teams use a helicopter to skip between isolated outbreaks along stretches of inaccessible river, basal bark spraying as they go. This year's effort has been very successful. Over 100 person hours have cleared up 1710 Parkinsonia plants along 130 km of water courses.

Curramore – a showpiece of dedicated weed control

In the region surrounding Curramore Wildlife Sanctuary in southeast Queensland, lantana is such a pervasive weed that many landholders have abandoned any control effort. However, AWC is identifying the most successful combination of techniques for controlling lantana in these tall wet forests, and quantifying the benefit to wildlife. By demonstrating that lantana can be successfully controlled, AWC hopes to catalyse restorative efforts throughout the region. 112 hectares of impenetrable lantana thicket has been removed with a combination of herbicide spray, hand pulling and cut stump herbicide. AWC, with input from Griffith University, is also investigating the effect of lantana removal on flora and fauna.

Hymenachne infestation before and after (right) eradication from wetland on Brooklyn Wildlife Sanctuary

Mick Blackman

Mick Blackman

Translocating threatened mammals

As readers of *Wildlife Matters* will be aware, Australia has the worst record of mammal extinctions in the world. Although weed invasion, altered fire patterns and habitat loss have had a part to play, the overwhelming contributor to the extinctions of Australian mammals has been feral animals in general and, in particular, feral predators (the cat and the fox). The extinction crisis is set to continue, with one quarter of our surviving mammals listed as threatened with extinction.

In an effort to turn back the tide of extinctions, AWC is implementing an ambitious program of mammal reintroductions, returning threatened species back into areas where they have become locally extinct. Major re-introduction programs are underway at five AWC sanctuaries.

- In collaboration with the WA Department of Environment and Conservation, all feral cats were removed from Faure Island in Shark Bay, WA.
- On the mainland, AWC has created feral-free areas at three sanctuaries (Scotia in western NSW, Yookamurra in SA, and Karakamia in WA's southwest) by eradicating cats and foxes from large fenced areas (up to 8,000 ha).
- Finally, strategic fencing and intensive baiting has reduced the density of feral predators at Paruna, also in WA's southwest, sufficiently to allow re-introductions to take place.

To date, AWC has successfully carried out over 70 translocations involving over 2050 individuals of 17 different species, ranging from birds, to small native rodents, and small to large marsupials, including arboreal species. Most translocations have been into AWC sanctuaries, but about 15% have involved transferring animals from AWC sanctuaries to restock other protected areas not managed by AWC.

Recent translocations

In September, in our biggest interstate translocation yet, 57 **Woylies** were moved from Karakamia to Scotia. The logistics of capturing, processing and airlifting such a large batch of animals are formidable. The project involved a military timetable executed by a team of AWC staff from the southeast and southwest regions, plus expert input on health and quarantine issues from the Veterinary Conservation Program at Adelaide Zoo and the consortium of research groups (of which AWC is a member) who are investigating the Woylie decline in the southwest.

The impetus for the Woylie translocation was twofold. First, the translocation is a crucial insurance measure because Woylies in the southwest are declining dramatically in all but two populations (one of the two stable populations is at Karakamia).

Second, after eighteen months of painstaking work, the Stage 2 fenced area at Scotia was declared feral-free in May (taking the total feral-free area to 8,000 ha), opening the way for the reintroduction of Woylies, Bridled Nailtail Wallabies and Numbats.

In the southwest, four **Banded Hare Wallabies** were moved onto Faure Island in the most recent of a series of translocations of this species that began in 2004. A total of 37 individuals have been moved to the island. Regular monitoring shows that the population has established well.

As mentioned above, AWC also carries out translocations from its sanctuaries onto land managed by the Department of Environment and Conservation (DEC). In June, at the request of DEC, we moved 36 **Brush-tailed Possums** from Karakamia to Lorna Glen, as part of a program to restore that property's native fauna.

AWC's Jo Williams releases a Western Barred Bandicoot at Faure Island

AWC is now the custodian of some of the largest and most important populations of Australia's threatened mammals. Over the next few years AWC's reintroduction programs will continue to develop by increasing the feral-free areas on sanctuaries already involved in the program and by expanding the network of sanctuaries in the translocation program. In this way, AWC's leadership in the field of translocations will provide a more secure future for Bilbies, Mala, Numbats and a range of other endangered species, including the Black-flanked Rock-wallaby (below).

A Black-flanked Rock-wallaby, part of a reintroduced population at Paruna Wildlife Sanctuary *Marie Lochman*

AWC's science program

One of the distinguishing features of AWC is the close integration between our science program and our land management operations. Our research projects inform the *design* of fire management plans, feral animal control programs and other land management operations. In addition, our science team plays a vital role in *measuring* the on-ground effectiveness of our land management operations. Our growing portfolio of field-based research projects is generating knowledge that will prove invaluable to all land managers including pastoralists, conservation agencies, indigenous communities and industry.

AWC Field Ecologist, Ray Lloyd, on a recent fauna survey *Wayne Lawler*

What are the functions of AWC's science program?

1. **Conducting biological inventories:** At each sanctuary, one of our priorities is to conduct a biological inventory of the fauna and flora species as well as ecosystems that are present. Such knowledge helps shape the design of land management strategies: we need to know what we are protecting in order to maximise the effectiveness of our land management operations. As indicated on pages 24-25 of this newsletter, our inventory work is also generating new information about the status and distribution of many species, particularly in remote areas of Australia.
2. **Designing land management strategies:** AWC's science team plays a key role in the design of fire management plans, feral animal control programs and other land management strategies. Responsibility for the implementation of these science-based plans then rests with AWC's operations team. In practice, both the design and implementation of land management strategies occurs

Radio-tracking Dingos by helicopter at Mornington *Nick Rains*

in an integrated manner, with the operations team intimately involved in the design phase and the science team assisting with implementation. The result is that AWC is developing a suite of land management strategies that are strongly science-based, but also reflect practical, operational factors. This integrated approach has been pivotal in our land management success to date – for example, in rolling out the largest private sector fire management program in northern Australia (in the Kimberley) and in creating the largest feral predator-free area on mainland Australia (at Scotia).

3. **Measuring the ecological condition of AWC properties:** Measuring the ecological condition (or health) of our properties is a critical medium-term objective for the AWC science team. We are developing a framework for measuring ecological health and have begun the process of implementation at several sanctuaries – watch out for a more detailed *Wildlife Matters* article in 2009. We believe our framework will set a benchmark for conservation in Australia, providing a rigorous, science-based approach to measuring whether a property is in good ecological health and tracking changes in health over time. The advantages of such a framework are significant:
   - By tracking ecological health over time, AWC will be able to detect any deterioration and adjust management strategies accordingly. We will have a strong scientific basis on which to evaluate success against our mission of delivering effective conservation for wildlife and habitats.
   - Donors (investors) will be able to monitor the "ecological returns" from their investment: in other words, donors will have more information about whether populations of key species – such as Bilbies and Gouldian Finches – are stable or increasing and whether ecosystems are functioning effectively. (Some of this information is already available and has been reported in *Wildlife Matters*.)
4. **Wildlife translocations:** As described on page 20 of this newsletter, AWC has conducted over 70 translocations of threatened wildlife. Our science team takes the lead in reintroducing mammal species back into areas where they have become regionally extinct.
5. **Research addressing key issues affecting conservation and land management:** There are many knowledge gaps that constrain our ability to protect Australia's wildlife and ecosystems. For example:
   - What are the factors that cause a given species to decline?
   - How do different threatening processes, such as fire and feral cats, interact?
   - What is the most effective way to implement fire management or to control feral predators?

Often working with partners (such as universities, and other conservation agencies) AWC has established a series of field-based research projects designed to address many of these key issues. In doing so, our team is taking science out of the lab and across the country to places as diverse as Cape York, Arnhem Land, the Kimberley, the Simpson Desert and the mallee country of western NSW. These projects are generating information of benefit to pastoralists, industry, conservation agencies and other land managers, highlighting the role of science in ensuring the work at AWC sanctuaries is a catalyst for broader regional conservation efforts.

The recent biological survey at Piccaninny Plains contributes to our objectives for inventory, research and ecological condition measurement

Wayne Lawler

A selection of AWC research projects

1. **Dingo-cat interactions:** Does a healthy dingo population suppress cat numbers, thereby benefiting small native mammals? Field research is being conducted at Mornington (where cats and dingoes are radio-collared) as well as Marion Downs, Wongalara, Kalamurina and Newhaven.
2. **Fox-cat interactions:** Does fox control result in an expansion of cat numbers? This question is being investigated at Scotia, and also Mt Gibson, in conjunction with the WA Department of Environment and Conservation and the Invasive Animals CRC.
3. **The decline in seed-eating birds:** AWC scientists and PhD students, based at Mornington, are examining the decline in seed-eating birds across northern Australia by measuring the effects of fire and grazing on the population health of Gouldian Finches and other finch species, as well as identifying the factors influencing food (grass seed) availability.
4. **Effects of grazing:** Across several sanctuaries, AWC is conducting large scale, long-term research on the recovery of fauna following the removal of large herbivores like cattle.
5. **Effects of fire on sensitive species:** AWC is carrying out research to determine the precise effect of different fire attributes (eg the intensity, size and patchiness of fires) on the health, breeding success and survival of Red-backed Fairy-wrens. Like many species that live in the grass layer, theses wrens are sensitive to fire and this research will help refine fire management to reduce impacts on fauna.
6. **The effect of habitat fragmentation:** Maintaining the ability of species to disperse between habitat patches as landscapes become fragmented is a key conservation issue. AWC is using population genetics coupled with intensive fieldwork to examine the dispersal capabilities of the threatened Purple-crowned Fairy-wren in the Kimberley. This information will allow us to predict the thresholds for habitat disturbance beyond which this species is likely to become locally extinct. In addition, we will identify the key populations that act as 'recolonisation' sources, allowing land managers to prioritise fairy-wren populations for conservation management.

Banded Crimson Finch — *Steve Murphy*

7. **Role of small-to-medium sized mammals in ecosystem processes:** Many of the species that have been lost from large parts of the Australian mainland were professional 'gardeners', constantly digging for food and to make burrows. Research being carried out at Scotia is measuring the impact of this group of animals on processes like litter decomposition rates, water and nutrient cycling, plant germination rates and recruitment.

A New Field Research Centre at Scotia

AWC's science program in the south-east has received a major boost with the opening of a new field research centre at Scotia. The research centre will play an invaluable role in AWC's translocation program and will be the centrepiece of a growing focus on wildlife health research, including the role of health in the success of re-introductions. The new lab received its first full "test run" (as the hub for health screening) during the transfer of over 250 Bridled Nailtail Wallabies from the breeding enclosures within Scotia into the 4,000 hectare feral-free area known as "Stage 2". Vets from the Royal Zoological Society of South Australia (Adelaide Zoo) performed health assessments on the wallabies, and established a population health profile. AWC now protects a substantial proportion of Australia's entire Bridled Nailtail Wallaby population at Scotia.

Just as the WildlifeLink Centre for Research and Conservation at Mornington has become a focus for research activity in the Kimberley, the Scotia Research Centre is set to become a hub for conservation-related research in the mallee country.

Scotia's new field research centre in action: AWC staff and Adelaide Zoo vets carry out population health tests on Bridled Nailtail Wallabies — *Sally Cantrill*

Biological inventory

One of the key objectives of the AWC science program is to undertake a biological inventory of each sanctuary, identifying which species and ecosystems are present (including threatened species and ecosystems). Such baseline information guides the development of management strategies and priorities, and enables AWC to evaluate the effectiveness of our management action by measuring, over time, any changes to key indicator species.

Apart from birds, most species are cryptic, and confirming their presence takes a degree of guile and persistence. Field ecologists have a broad range of techniques to help detect different groups of species – sound recording for frogs, infrared cameras for nocturnal animals, analysis of scats, many different sorts of traps, observation of tracks, genetic analysis of hairs, and so on. Some of the more exciting discoveries made at AWC sanctuaries in the past six months are described below.

New subspecies of dunnart discovered at Wongalara?

The 48 permanent monitoring sites set up across Wongalara (mainly to track changes in response to management) were operated during July and August this year. One of the more exciting captures was a dunnart – exciting because there are no records of dunnarts from the Wongalara area. The dunnart superficially resembled a Kakadu Dunnart (*Sminthopsis bindii*), but the key diagnostic features of the footpads did not match up. In order to confirm its identity, a small tissue sample was taken from the dunnart before it was released. AWC staff member Steve Murphy extracted DNA from this sample at the Biosciences Lab in Darwin, and then amplified (using PCR) and sequenced an informative stretch of DNA. The results were compared against an existing phylogeny for dunnarts.

This analysis confirmed that the 'Wongalara dunnart' was a Kakadu Dunnart, and yet it was sufficiently different to be considered a separate subspecies. For example, using an informative section of DNA, the genetic divergence between the Kakadu Dunnart and the 'Wongalara dunnart' is approximately 1%, which is enough to be considered a distinct genetic lineage. By comparison, another widely accepted "subspecies pair" of common dunnarts also differ by about 1%. The discovery of the 'Wongalara dunnart' highlights not only AWC's commitment to biological inventory, but also the high level scientific skills within the organisation which enable such genetic analyses to be undertaken.

Kalamurina – unexpected treasures from the desert

In July-September we carried out our first series of surveys at Kalamurina. AWC ecologists carried out surveys of one hundred two-hectare plots for mammal and reptile tracks. In doing so, they made some notable captures, including a Kultarr and a Dusky Hopping Mouse. The record for the latter species is the most westerly record off the Birdsville track.

In addition, a stalwart group of volunteer birdwatchers, led by Richard Jordan, endured sandstorms and heavy rain to undertake systematic bird surveys at the permanent monitoring sites. They also searched the lignum-lined banks of the Warburton Creek system for Grey Grasswrens, and were rewarded with clear sightings at two locations. The Lake Eyre Basin subspecies of

A Spotted Cuscus at Piccaninny Plains *Wayne Lawler*

Palm Cockatoo at Piccaninny Plains *Wayne Lawler*

Brush-tailed Mulgara at Newhaven — Josef Schofield

the Grey Grasswren has only been previously reported from further upstream on the Diamintina-Warburton system, making this an exceptionally interesting range extension.

Mulgara and Marsupial Moles at Newhaven

Several AWC staff and members of the local Nyirripi community, together with a number of volunteers, carried out a major series of bird, mammal, reptile and vegetation surveys at Newhaven during March and April. The surveys provided valuable data on species presence and abundance in relation to vegetation type, age since fire, and distance to water. The surveys also turned up a number of rare species including relatively large numbers of Brush-tailed Mulgara (Vulnerable), Marsupial Moles (Endangered), and Great Desert Skinks (Vulnerable). The highlights of the bird surveys were Grey Falcons, Australian Bustards, Bourke's Parrots, Rufous-crowned Emu-wrens, Dusky Grasswrens and large numbers of Painted Finches. A brief sighting of Scarlet-chested Parrots resulted in much excitement and vigorous debate; this record needs confirmation.

Piccaninny Plains

Within months of finalising the acquisition of Piccaninny Plains, the first biological survey of this remarkable property has been completed. AWC scientists and volunteers carried out more than 3,800 trap nights during October and November, targeting a selection of rainforest, wetland, woodland and grassland sites. The results were impressive, confirming the exceptional significance of Piccaninny Plains for the fauna of Cape York.

One of the most significant findings of the survey was the high number of species endemic to the northern Cape, including Papuan Frogmouth, Spotted Cuscus, Trumpet Manucode and the Magnificent Riflebird. A further four species that were found along the Archer River are extremely significant because they are typically associated with the east coast rainforests around Lockhart River and Iron Range National Park – that is, these species are generally considered to be limited to the east side of the Dividing Range:

- Southern Common Cuscus (*Phalanger mimicus*)
- Cape York Melomys (*Melomys capensis*)
- Double-eyed Fig-parrot (*Cyclopsitta diophthalma macleayana*)
- Black-winged Monarch (*Monarcha frater*)

The Archer River rainforests are clearly an important extension of the unique forests of the east coast.

It is also apparent that Palm Cockatoos are relatively common on Piccaninny Plains. AWC scientists even saw a family with a juvenile (which means they bred nearby). Interestingly, the Palm Cockatoos and Riflebirds had a different dialect to the birds on the east coast at Iron Range, suggesting there is some population differentiation between the two places.

Marion Downs – a refuge for threatened mammals

Despite the proximity of Marion Downs to Mornington, it has a distinct set of ecosystems. Our first inventory survey at Marion Downs, carried out in August, was designed primarily to collect evidence of Northern Quolls, which are nationally Endangered. Quolls occur on Mornington in rocky and infrequently burnt areas; we wanted to see whether this pattern held true at Marion Downs as well.

Not only did we find quolls during the surveys on Marion Downs, but also Northern Brown Bandicoots, in wetter, sandy soils at the foot of damp gullies. This species is not listed as threatened, but it has declined substantially across the tropical savannas of northern Australia.

AWC's Rigel Jensen and Brian Venables (volunteer) at Piccaninny Plains with a very rare plant (*Analcolosa papuana*) — Wayne Lawler

Supporting AWC

Optus and AWC celebrate the first anniversary of our partnership

In September 2007, AWC and Optus launched an innovative new partnership to help save some of Australia's most threatened species. Called "Building Better Homes for Australian Wildlife" this exciting initiative is generating funding for a number of key AWC projects, as well as leveraging Optus' extraordinary market reach to help raise public awareness about wildlife conservation issues. The results to date have been outstanding:

- As part of the first project supported by Optus, five endangered Yellow-footed Rock-wallabies have been radio-collared at Buckaringa Sanctuary in the Flinders Ranges. The data collected by these radio collars will provide information about the movement and distribution patterns of the wallabies, and will inform decisions about their on-ground management and protection.
- Optus has also assisted with the acquisition and protection of Kalamurina, helping us to secure around 20,000 acres of desert wilderness.
- In the Kimberley, Optus has supported our efforts to protect populations of the threatened Purple-crowned Fairy-wren. We have now located 155 groups of Fairy-wrens and have captured, banded and released 319 individuals. Optus staff drove a national campaign to raise funds internally for this important project.

In addition to providing direct financial assistance for these "on-ground" projects, Optus has played a significant role in helping AWC raise public awareness about Australia's threatened wildlife through a range of innovative communication channels linked to the Optus website and customer network. For example, Optus built an interactive website, www.optus.com.au/wildlife. Now, over 30,000 members can download educational material, play games, and track AWC's progress online. In addition, Optus has deployed an extensive electronic and print media campaign, taking our conservation message to several million Optus customers, recruiting many new donors and generating a significant level of donations.

One of these campaigns, a competition called "Save them for a Song," attracted over 10,000 entrants who learned about the plight of the Purple-crowned Fairy-wren. In August, two winning couples, accompanied by Optus staff, spent an inspiring weekend with AWC's team at Mornington where they encountered these endearing little birds "first hand."

After 12 months, the partnership between AWC and Optus is generating significant benefits for both parties. Most importantly, it is demonstrating how a good corporate citizen like Optus can make a real difference for Australia's wildlife.

Grey Grasswren graemechapman.com.au

AWC supporter Mike Cook at Scotia

AWC and The Nature Conservancy

As reported on pages 24-25, the Grey Grasswren has recently been recorded at Kalamurina. This is a major range extension and highlights the importance of this vast new desert reserve. AWC was supported in the acquisition of Kalamurina by two of our key partners – The Nature Conservancy and The Thomas Foundation. Under the Thomas Challenge, donations to AWC of more than $10,000 for eligible projects, such as Kalamurina, may be matched by The Nature Conservancy. More broadly, The Nature Conservancy provides assistance to AWC and its other Australian partners in a range of ways including through the sharing of knowledge on technical matters and assistance and advice on capacity building and development activities.

Funding the Scotia Research Centre

In October 2008, the Scotia Research Centre was completed in time to play a vital role in the translocation of Woylies from Karakamia and the release of Bridled Nailtail Wallabies into Stage 2 (see page 20). Construction of the Centre was funded by a generous gift from Mike Cook, pictured here inspecting a nest built by a Greater Stick-nest Rat at Scotia. Thousands of other AWC supporters from all around Australia help support the ongoing management of Scotia and our other sanctuaries, including feral animal control, staff salaries and maintenance of assets and infrastructure.

Phillips Range, Marion Downs

Ecopix

AWC partners with business to save Australia's wildlife

While individuals will always be the primary source of donations to AWC, we are delighted to announce significant growth in the level of support from Australian businesses. Despite the slowing economy, four leading companies have recently entered into partnerships with AWC to support conservation where it really counts – *in the field*.

- Mornington in the central Kimberley is a favourite travel destination for **Outback Spirit Tours**, an outdoor travel company, with a long history of taking adventurous holiday-makers to memorable locations well off the beaten track. *"As a company that relies heavily on the natural environment, we felt compelled to contribute towards saving some of our most precious wildlife. That's why we've committed to donating $20 from each passenger fare for the 2009 season to AWC. Over the year, this humble sum will add up to over $70,000 and will help support important AWC conservation projects."* says Andre Ellis, Director of Outback Spirit Tours. **www.outbackspirittours.com.au**
- Protecting wild, remote places is a theme that also resonates with **Kathmandu**, an international retailer of outdoor clothing and equipment. Kathmandu is making a vital and timely contribution to AWC for the management and conservation of Marion Downs. Kathmandu intends to leverage its chain of 43 national stores and strong online presence to help generate public awareness and further fundraising to assist AWC implement priority actions at Marion Downs, such as weed eradication, fire management and biological surveys. **www.kathmandu.com.au**
- **Exterra** is Australia's leading provider of environmentally friendly, non-toxic termite interception and baiting systems for the urban market. Proceeds from the sale of each system will be donated to AWC to support the conservation and management of Australia's threatened wildlife and their habitats. Exterra recently reported that sales for termite interception and baiting systems are currently up by 25%! This is great news for AWC. Exterra is launching its support for AWC with a national competition, whereby a family of four can win a weekend at AWC's Scotia Sanctuary. **www.exterra.com.au**
- **Skansen**, a wholesale distributor of Australian toys, is also helping to raise funds for AWC. Following the production of the Yellow-footed Rock-Wallaby Beanie Kid (currently being sold in stores around Australia), Skansen is using an "Adopt an Aussie" theme to launch a series of Australian toys. A portion of the proceeds from sales of these toys are donated to AWC. In addition, Skansen has built an interactive, educational website to educate its 100,000 members about the plight of Australia's threatened wildlife and the work of AWC. **www.adoptanaussie.com.au**

Please contact Shauna Chadlowe in our Sydney office (02 9324 4210) if you are interested in exploring opportunities for your business to partner with AWC.

we urgently need your help

yes, I want to help awc save australia's endangered wildlife


Dingo — P. Rothlisberg


Purple-crowned Fairy-wren — S. Murphy


Spectacled Hare Wallaby — Lochman Transparencies

▲ *Newhaven is a joint project with Birds Australia*

Pungalina-Seven Emu

☐ **Please direct my donation to Pungalina-Seven Emu.**

- A donation of $100 will purchase and protect nearly 3 hectares of tropical savanna.
- A donation of $1000 will purchase and protect nearly 30 hectares of the Calvert River catchment.

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 $25 or more. Please send me a certificate commemorating my contribution.

Support AWC this Christmas

To give a tax-deductible Christmas gift that supports an AWC project, go to www.australianwildlife.org or call Beth/Vanessa on +61 8 9380 9633.

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: _____

Printed Name in Full: _____

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 Institution if the direct debit facility is not available on your account.)

australian wildlife conservancy

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