



wildlife matters

australian



wildlife
conservancy

Summer 2012/13



Feral cats: killing 75 million
native animals every night

Saving Australia's threatened wildlife



Welcome to the Summer 2012/13 edition of *Wildlife Matters*.

As you will read in the following pages, our focus remains firmly on battling the "ecological axis of evil" – feral animals, wildfires and weeds. For decades, these forces have been steadily eroding Australia's natural capital, causing the extinction of wildlife and the destruction of habitats and ecological processes. The role of feral cats – which kill 75 million native animals every day – is particularly significant.

Our response to this tripartite attack on Australia's natural capital is straightforward – we deliver practical land management informed by world-class science. Central to our strategy is the fact that around 80% of our staff are based *in the field*. AWC's dedicated team of field operatives – land managers and ecologists – represent the front-line in our battle against fire, ferals and weeds. Within the conservation sector, we are unique in deploying such a high proportion of our staff *in the field*.

To date, this strategy has delivered significant, measurable and very positive ecological returns. This success is particularly apparent when considering the surviving populations of Australia's most endangered mammals. Species such as Numbats, Woylies and Bilbies are increasing on AWC sanctuaries even though they are generally in decline elsewhere (see pages 10-11). We now protect a high proportion of the total remaining population of several iconic Australian animals.

This edition of *Wildlife Matters* reports also on several other recent highlights including:

- the establishment of the largest feral herbivore-free area on the mainland; and
- our continued leadership on fire management in the Kimberley.

In the context of our battle with fire, ferals and weeds, it is worth reflecting on the contrasting fortunes of Australia's financial and natural capital. Indicators of *financial* capital may fluctuate in the short-term but their long-term trends have been positive: the ASX 200 may be below its peak but it is still higher than at any time before 2005. In contrast, almost all of our indicators of *natural* capital have been in steep decline for several decades. While it is not widely recognised, we have been experiencing one very long bear market in terms of natural capital! However, our financial and natural capital cannot keep heading in different directions. The decline in our natural capital is a severe risk to the long-term health of our financial capital.

With scarce resources, AWC has been playing a key role in turning around natural capital indicators by delivering above-market ecological returns – whether measured in terms of the abundance of small mammals, the population of Purple-crowned Fairy-wrens or other ecological health indicators. With your support, AWC will continue to deploy an effective strategy – practical land management and good science – designed to defeat those forces that are taxing our natural capital: wildfire, ferals and weeds.

Thank you for being part of the team in 2012. From all of us at AWC, we wish you a Merry Christmas and a very Happy New Year.



Atticus Fleming
Chief Executive

The AWC mission

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

- Establishing a network of sanctuaries which protect threatened wildlife and ecosystems: AWC now manages 23 sanctuaries covering over 3 million hectares (7.4 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.
- Over the last five years, around 90% of AWC's total expenditure was incurred on conservation programs, including land acquisition, while around 10% was allocated to development (fundraising) and administration.

Cover Photo: Feral cat (photo: M.Davis/Invasive Animals CRC)

Australian Wildlife Conservancy
PO Box 8070
Subiaco East WA 6008
Ph: +61 8 9380 9633
www.australianwildlife.org

Sir David Attenborough Field Research Station: unlocking the secrets of the Artesian Range



Sir David Attenborough with AWC Director Tim Flannery, celebrating the Attenborough Field Research Station

T.Hosking

AWC is set to establish one of Australia's most remote field research stations to help unlock the secrets of the Artesian Range. The new facility – to be named the “Sir David Attenborough Field Research Station” – will play a vital role in providing a more secure future for some of Australia's most endangered wildlife.

Honouring Sir David Attenborough

The Artesian Range field research facility is to be named in honour of Sir David Attenborough in recognition of his role in inspiring science-based conservation across the planet for more than 50 years. Sir David Attenborough recently accepted the honour from AWC Director Tim Flannery at a small presentation in Sydney during Sir David's recent Australian tour.

Sir David's work has helped showcase the importance of science in protecting the natural world. AWC also recognises the critical role of science: it forms a key component of our conservation model by informing the development of land management strategies and tracking the ecological health of our properties. We have over 20 field-based scientists on staff including over a dozen with PhD qualifications. The Attenborough Field Research Station will complement two other science facilities established by AWC: the TLLF WildlifeLink Research and Conservation Centre at Mornington and the well-equipped Bettongia research centre and lab at Scotia.



A Monjon in the Artesian Range

A.Heartsthorne

The importance of the Attenborough Field Research Station

AWC is delighted that Sir David has lent his support to the conservation of the Artesian Range Wildlife Sanctuary, a “lost world” of rugged sandstone ranges and deep rainforest-filled gorges. The Artesian Range and surrounds are home to at least 30 species that are found nowhere else on mainland Australia. Some of these animals, such as the Monjon, are endemic to the region. Others, such as the Golden-backed Tree-rat, once occupied a large area of Australia but have suffered catastrophic declines and now survive only in a thin strip of land along the Kimberley coast.

Using the Attenborough Field Research Station as their base, our intrepid scientists will attempt to unlock the secrets of the Artesian Range, exploring why so many species have been able to make their last stand in this extraordinary landscape. Key issues include the impact of fire and cats on priority mammal species. Our scientific work in the Artesian Range will influence the design of land management strategies in the Kimberley and elsewhere across northern Australia.

As a supporter of AWC, I hope you are as thrilled as all of our staff to honour Sir David in this way and to welcome his contribution to the Artesian Range initiative. To see spectacular footage of the Artesian Range, visit <http://www.youtube.com/awcwildlifematters>, browse the videos and view the episode of Channel Seven's *Sunday Night* program, entitled *The Land That Time Forgot*.

AWC works in partnership with the Western Australian Government to protect the Artesian Range under the Kimberley Science and Conservation Strategy.

Stopping the slaughter: fighting back against feral cats



A feral cat caught on camera trap hunting in the Kimberley



Fitting a radio collar

A. McNabb

“... these feral cats are a terrible scourge, when we consider the vast numbers of the more rare, interesting, and beautiful members of our native fauna that are annually destroyed by them.”

F Wood Jones, The Mammals of South Australia (1925)

Feral cats occur right across the continent in every habitat type including deserts, forests and grasslands. Total population estimates vary from 5 million to 18 million feral cats, with the Federal Government citing a figure of 18 million cats in its statutory Threat Abatement Plan.

Each feral cat kills between 5-30 animals per day. While they appear to prefer small mammals, they also eat birds, reptiles and amphibians. Taking the lower figure in that range (five) – and multiplying it by a conservative population estimate of 15 million cats – gives **a minimum estimate of 75 million native animals killed daily by feral cats.**

Some caution is needed in interpreting this figure as a surrogate for the overall impact of cats: for example, the invasion of cats has likely caused a profound restructuring of the faunal community including a reduction in the abundance of native predators. Some of the prey now taken by cats may previously have been taken by more abundant native predators. However, even allowing for this type of factor, it is clear that cats are playing a critical role in the decline of our native fauna. They are recognised as a primary cause of several early mammal extinctions and are identified as a factor in the current declines of at least 80 threatened species. Only a few months ago, feral cats decimated a population of Bilbies at Currawinya National Park. At Dryandra Woodland Reserve in Western Australia, cats have recently hunted the Numbat population to the brink of extinction.

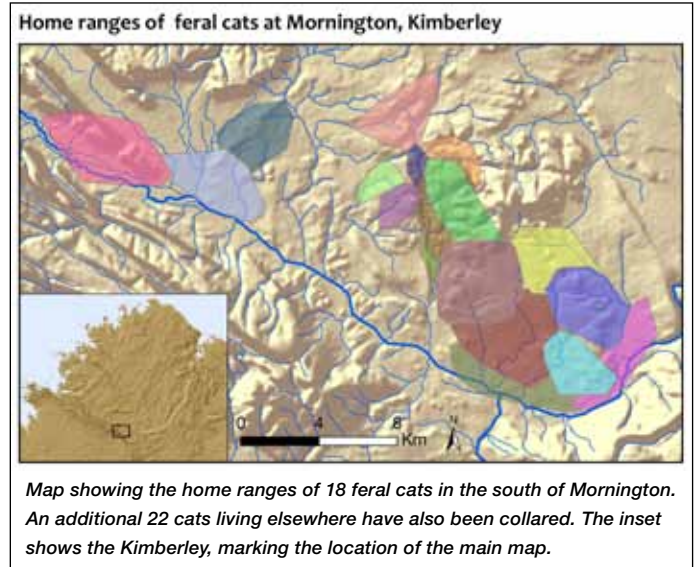
What can we do to control cats?

“Although total mainland eradication may be the ideal goal of a [Threat Abatement Plan], it is not feasible with current resources and techniques.”

Feral Cat Threat Abatement Plan, Australian Government

The only successful feral cat eradication programs in Australia have been carried out on islands or within mainland areas surrounded by a feral-proof fence. These include the following AWC sanctuaries: Faure Island (6,000 ha), Scotia (8,000 ha), Yookamurra (1,100 ha) and Karakamia (250 ha). Scotia contains the largest cat-free area on the mainland; in total, AWC manages more feral cat-free land on mainland Australia than any other organisation.

Unfortunately, techniques such as baiting, trapping and shooting - which allow islands and fenced areas to be laboriously cleared of feral cats - are not currently effective at a landscape scale. Cats are difficult to locate and extremely wary, which makes trapping and shooting resource-intensive and impracticable. In addition, the removal of cats from one area is offset by immigration from adjacent areas. Baiting is also currently limited in effectiveness (cats do not readily take bait as they are live prey specialists; and baiting can have a significant impact on native species). Finally, the introduction of diseases (biological control) does not represent a viable option at this stage: for example, many of the diseases are already in the wild cat population.



Developing a practical strategy to reduce the impact of cats

Given that the complete eradication of cats at a landscape level is not currently feasible, AWC has developed a practical strategy designed to minimise their impacts and facilitate the development of a long-term solution.

AWC FERAL CAT STRATEGY

A	GROUND COVER: impair the hunting efficiency of cats in grasslands and woodlands by manipulating ground cover through: <ul style="list-style-type: none"> • minimising the frequency and extent of late-season wildfires; and • reducing the density of feral herbivores.
B	DINGOES AS A BIOLOGICAL CONTROL: reduce the density of cats and affect hunting behaviour by promoting a stable Dingo population.
C	FERAL CAT-FREE AREAS: establish feral cat-free areas to protect core populations of species most vulnerable to cats.
D	STRATEGIC CONTROL: strategic implementation of control measures such as shooting and baiting to protect highly threatened species.
E	RESEARCH: generate scientific knowledge that will help design a long-term solution enabling the control of cats and their impacts across landscapes and, ideally, the eradication of feral cats.

We recognise that our feral cat strategy must be implemented as part of an integrated approach with our fire management and feral herbivore control. These three factors – altered fire regimes, feral predators and feral herbivores – represent the “ecological axis of evil”: the primary factors driving the decline in our native wildlife. Our overall land management approach is intended to combat all three factors.

Informing and developing our strategy

In order to reduce the impacts of cats, we need to know more about them – about their ecology and behaviour and about the way they interact with fire and feral herbivores. Our cat research has a very practical focus. It is designed to inform the development of land management strategies that reduce the impact of cats on our wildlife as well as inform the development of a long-term solution which will enable the control (and ideally the eradication) of feral cats.

Our research is focused at Mornington and Marion Downs in the Kimberley, where 40 feral cats have been collared with GPS tracking devices, some for almost two years, as part of a PhD undertaken by Hugh McGregor. No research program in Australia has ever radio-collared this many cats. As this edition of *Wildlife Matters* goes to press, 17 cats are carrying radio collars. The information obtained from these feral cats is significantly increasing our knowledge of their ecology and behaviour.



Feral cat stomach contents including Delicate Mouse, Agile Wallaby (joey), quail and a skink



Feral cats target prey on the edge of late-season fire scars

M.O'Donnell

What have we learnt about feral cat ecology and behaviour?

Our research to date has generated a great deal of new information about feral cats. Such information is vitally important – not only does it help us in designing land management strategies that will disadvantage cats in the short term, it is also relevant to the development of any longer-term options such as biological control.

What have we learnt so far?

- The average home range of cats in the Kimberley is around 900 hectares. Male cats have a larger home range and there is some overlap between home ranges.
- Over time, we have seen home ranges expand and territories shift. This is possibly related to the loss of cats from neighbouring territories (two of our radio-collared cats were eaten by Olive Pythons) and/or changes in prey resource availability.
- Cats are more active at night in hot weather (where the minimum temperature is above 30°C) but are more active during the day in cold weather (where the minimum temperature is below 10°C).
- We have developed a new method to estimate the abundance of cats by performing mark-recapture analysis after identifying individual cats from their coat patterns (as they appear on infra-red camera traps). Until now, measuring cat densities has been a very rough science based on activity indices from track transects and sandplots. The new method will allow our science team to more accurately monitor changes in cat density.
- In a “world first”, we have deployed five GoPro video cameras on feral cats. The footage from these cats has given us a unique insight into how they use habitat – for example, they avoid dense grass and use creeklines for navigation. We have also witnessed a number of predation events that highlight the opportunistic nature and ambush tactics of cat hunting behaviour: one resting cat suddenly roused itself to kill a native dragon that it heard nearby and then promptly resumed resting. This footage can be viewed on our YouTube channel: awcwildlifematters.

The interaction between fire and cats

As reported in previous editions of *Wildlife Matters*, AWC's research has revealed – for the first time – that feral cats move long distances (e.g. 14km) through the landscape to take advantage of intense, late season wildfires. Such fires typically remove more than 90% of the ground cover within the fire scar, leaving native animals without shelter and food. This makes it easy for cats to move in and “mop up” displaced native animals at the edge of the fire scar.

Our Kimberley team recently witnessed this effect while visiting a late-season fire scar on Marion Downs. The team saw five cats on the edge of the fire scar in the space of just a few hours – three of these cats were caught and radio-collared using AWC's specially-trained cat detection dogs.

We have recently focused the research at Mornington on comparing the way cats respond to cooler, prescribed burns (which typically leave around 60% of ground cover intact) with their response to wildfires. During 2012, we carried out prescribed burns in the home ranges of nine of our radio-collared cats. Detailed pre- and post-fire movement data was collected. Our analysis revealed that prescribed burning had a minimal impact on cat movement behaviour – the “mopping up” effect was not apparent, presumably because enough ground cover remains within an early-season fire scar and so native animals are not displaced.

This research highlights the importance of fire management in minimising the impact of feral cats on our native fauna. It is essential that land managers limit the extent of high intensity fires in order to protect ground cover and so reduce the efficiency of hunting by feral cats.

Dingoes as a biological control agent

As is apparent from the photo on the previous page, Dingoes will kill feral cats. We have been examining the relationship between Dingo activity and feral cat activity (as measured on sandplots) at 10 sites across five properties. Part of that study involved monitoring the change in predator activity before and after baiting for Dingoes. Our findings showed that Dingo activity was reduced as a result of baiting but cat

activity remained the same. This suggests that the presence of Dingoes may do more than just affect cat *behaviour* – in some cases, the presence of Dingoes is also likely to suppress the *density* of feral cats. In this way, the maintenance of a stable Dingo population may play a critical role in reducing the impact of cats on native mammals: stable Dingo packs may mean more Bilbies!

To further explore this relationship, five cats and five Dingoes living in the same area have been simultaneously radio-collared at Mornington. We have been collecting movement data since April/May as part of a joint project with Leila Brook, a PhD student at James Cook University. This data will help us better understand the extent to which Dingoes can be employed to limit the impact of feral cats.

Can we protect high value areas with intensive cat control?

Although baiting, trapping and shooting are not practical control methods across large landscapes, they may be useful in smaller areas with particularly high conservation value.

To test this option, we are carrying out a partial cat removal experiment over 6,000 hectares at Mornington by shooting previously-collared cats. Using camera traps, we will monitor the speed of reinvasion of the "empty" territories by dispersing cats. This experiment will indicate the feasibility of keeping cat densities low in defined areas.

We need your help to save our wildlife from feral cats

We need your help in the battle to save our wildlife from feral cats. Please make a tax deductible donation to support:

- Practical land management that will limit the impact of cats.
- Strategic on-ground action including fencing and shooting.
- Feral cat research designed to find a long-term solution to feral cats.

Your donation will help protect native animals at risk from feral cats, such as the Bilby, the Mala and a host of our small northern mammals. For more information on how to donate, please see page 20 or the enclosed form.



Radio-collared Dingo at Mornington (camera trap)



The Mala, or Rufous Hare-wallaby, is particularly vulnerable to feral cats

W. Lawler

Mt Gibson Endangered Wildlife Restoration Project



Numbat

W. Lawler

The Mt Gibson Endangered Wildlife Restoration Project will provide a more secure future for more than 10% of Australia's threatened mammal species. By substantially increasing the population of nine threatened species, our investment at Mt Gibson will deliver a higher ecological "return" than any other mammal conservation project in Australia.

The mammal extinction crisis

Australia has the worst mammal extinction record in the world. Twenty two mammals have become extinct in the last 200 years. This represents around one third of the planet's mammal extinctions in that period. Our mammal extinction crisis is ongoing: around 20% of surviving mammal species are listed under federal legislation as being at risk of extinction.

All but one of the mammal extinctions in Australia have occurred in the arid or semi-arid zone. Almost all of the remaining small-medium sized mammal species in this zone have suffered massive range contractions and/or a catastrophic drop in population size. The Numbat, for example, has now disappeared from more than 90% of its original range.

The impact has been particularly severe in the wheatbelt region of south-western Australia – where Mt Gibson is located – which has lost 55% of its original mammal fauna. There are few areas on the planet that have lost such a high proportion of their original mammal species. In this region, and elsewhere across southern and central Australia, the factors propelling the wave of extinctions are feral predators (foxes and cats), feral herbivores (such as rabbits and goats) and habitat destruction.

The strategy at Mt Gibson

At Mt Gibson, our key strategy is to establish a 6,000 hectare feral-free area – the largest such area on mainland Western Australia – into which at least nine threatened mammal species will be reintroduced. We believe this strategy will maximise the ecological returns (i.e. the recovery of mammals) for the proposed level of investment.

The need for a feral-proof fence: the complete exclusion of feral cats and foxes is necessary to ensure the long-term success of any reintroduction of small-medium sized mammals in the arid and semi-arid zone. However, there is currently no effective strategy for the landscape-scale eradication of foxes and cats. The only option is, therefore, the construction of a feral-proof fence. Feral-proof fences are successfully deployed by AWC at Scotia, Yookamurra and Karakamia – in fact, AWC manages more fox and cat-free land than any other organisation on mainland Australia. At Mt Gibson, a specially designed feral-proof fence – impenetrable to foxes, cats, rabbits and goats – will extend for 43 kilometres and enclose 6,000 hectares of diverse habitat.



Western Barred Bandicoot

W. Lawler

Selecting the species to be reintroduced: seventeen mammal species have disappeared from Mt Gibson and the surrounding wheatbelt region. Four of these species are extinct, while the

remainder survive only in remnant populations elsewhere (e.g. offshore islands). AWC plans to initially reintroduce 10 species at Mt Gibson, of which nine are threatened (see list below). A rigorous scientific process was used to select the species for reintroduction based on criteria such as conservation status, the area of suitable habitat on Mt Gibson, the level of competitive interaction between species, the availability of source populations and the contribution that Mt Gibson could make to the survival of the species.

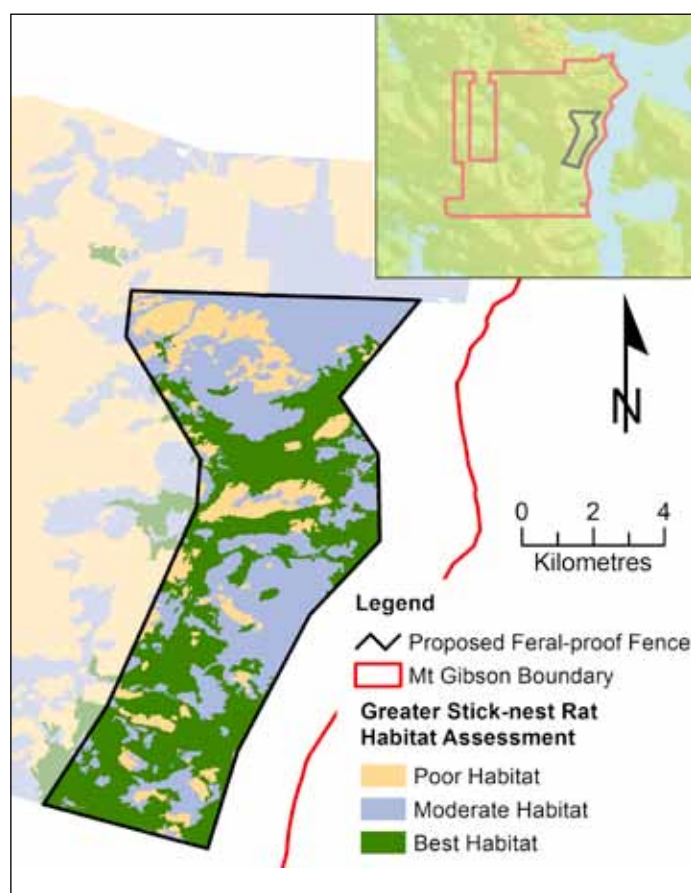
Species name	Approx global population size (including other AWC sanctuaries)	Approx target Mt Gibson	Percentage increase in global population
Woylie	10,000	400	4%
Banded Hare-wallaby	8,000	900	11%
Greater Stick-nest Rat	3,000	1,200	40%
Bilby	10,000	600	6%
Numbat	750	250	33%
Western Barred Bandicoot	5,000	1,000	20%
Red-tailed Phascogale	3,000	400	13%
Shark Bay Mouse	6,000	2,000	33%
Chuditch	8,000	100	1%

Identifying the area to be fenced: we have selected a 6,000 hectare area of Mt Gibson that encloses the highest density of good quality habitat for the candidate species. In other words, we have identified the area of Mt Gibson which will maximise the “carrying capacity” for our candidate species. This process involved:

- The production of detailed habitat maps using aerial photography and ground-truthing to describe key habitat attributes (floristics, structure, ground-cover etc).
- The identification of critical habitat requirements for each candidate species and mapping where these requirements occurred at the highest quality.
- Overlaying the “habitat quality” maps for each species to find the area with the highest cumulative habitat quality score.

The ecological return: increasing the population of 9 threatened mammals

The establishment of the largest feral-free area in Western Australia will require an initial investment of around \$2.5 million. However, the ecological return from this investment will be exceptional, *delivering a substantial increase in the global population of at least nine threatened species by 2017*. For example, we expect this single project to increase the total population of Greater Stick-nest Rats by 40%, the Numbat population by 33% and the Shark Bay Mouse population by 33%.



Altogether, we expect the feral-free area to be home to more than 7,000 animals across the nine species. Mt Gibson, with an abundance of small-medium sized native mammals, will then resemble the Australian bush as it was 200 years ago, before feral cats and foxes decimated our native wildlife and rendered much of inland Australia “a marsupial ghost town”.

We expect the removal of feral animals and the return of native digging mammals to also deliver broader ecological benefits including an increase in the richness and abundance of ground-dwelling birds (e.g. malleefowl) and an improvement in ecosystem processes such as nutrient and water retention.

We need your help

Please make a tax deductible gift to help us establish the largest feral predator-free area in Western Australia and provide a more secure future for nine threatened mammal species. For information on how to donate, please see page 20 or the enclosed donation form.



Mature salmon gum at Mt Gibson Wildlife Sanctuary

W. Lawler

Back from the brink: an update on our endangered mammal populations



Boodies at Scotia

W. Lawler

Over 20 Australian mammals have become extinct since European settlement. More than 50 mammal species are now on the brink, listed by the Federal Government as nationally threatened with extinction. For more than a decade, AWC has delivered practical land management, based on good science, to help provide a more secure future for a suite of Australia’s highly threatened mammals. Often working in collaboration with partners, including government agencies, our role in southern and central Australia has focused on creating large feral predator-free areas in which we could re-establish wild, self-sustaining populations of endangered mammals. Here is a snapshot of the results to date, highlighting the importance of AWC – and the critical role of feral predator-free areas – in preventing the extinction of several species.

Woylie (Brush-tailed Bettong)

The Woylie was once very widespread with records in all mainland states and the Northern Territory. By 1970, it had experienced a dramatic decline, being confined to four subpopulations in south-western Australia. It staged a recovery in the late 1990s and was prematurely removed from the threatened species list. However, from 1999 the Woylie population has again been in freefall. It is estimated that the total population has declined by over 90% in the last decade, with cat predation a key factor driving the decline.

Population outside of AWC properties: The population has declined from around 250,000 individuals in 1999 to a current estimated population of less than 10,000.

AWC’s contribution:
AWC protects three significant populations of the Woylie. Karakamia protects an estimated 550 Woylies, Scotia contains 700 Woylies and Yookamurra protects 250 animals. AWC therefore protects around 15% of an estimated world population of 10,000.

Location	Population	Percentage
AWC properties	1,500 Woylies	15%
Other	8,500 Woylies	85%

Boodie (Burrowing Bettong)

The Boodie was once one of the most abundant and widespread of all Australian mammals, occupying most of the southern half of the continent west of the Great Dividing Range. However, by 1960 it was extinct on the mainland and clinging to survival on offshore islands. The Boodie is the only member of the kangaroo family to construct and live in their own burrows. Burrows can be complex warrens with multiple entrances and interconnecting pathways, and up to 20 individuals living communally. AWC protects the Boodie at Faure Island in Shark Bay as well as at Scotia and Yookamurra.

Population outside of AWC properties: The Boodie population outside of AWC sanctuaries is around 12,000 animals; major populations are on Bernier and Dorre Islands in Shark Bay, Barrow Island and at the Arid Recovery project near Roxby Downs.

AWC’s contribution:
AWC protects the largest Boodie population (more than 4,500 animals) at Faure Island. The Scotia population is around 1,300 animals while Yookamurra protects 250 Boodies. AWC therefore protects around 33% of the total Boodie population.

Location	Population	Percentage
AWC properties	6,000 Boodies	33%
Other	12,000 Boodies	67%



Greater Bilby

W. Lawler



Woylie

W. Lawler



Bridled Nailtail Wallaby

W. Lawler

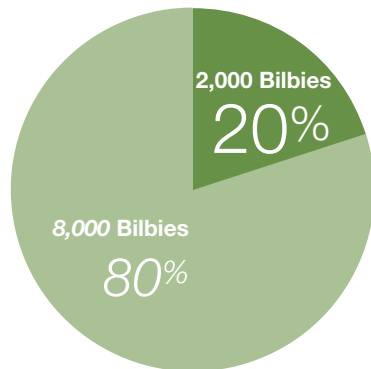
Greater Bilby

The Greater Bilby once occupied a large proportion of arid and semi-arid Australia. However, it is now restricted to populations in the Gibson, Great Sandy and Tanami Deserts, parts of the Pilbara and south-western Queensland. There are a small number of reintroduced populations, including at the Arid Recovery Project near Roxby Downs, as well as AWC populations at Scotia and Yookamurra. The primary causes of the widespread decline of the Greater Bilby are predation by foxes and feral cats plus competition from rabbits. Its closest relative, the Lesser Bilby, is now extinct.

Population outside of AWC properties: There is no rigorous population monitoring of the remnant populations in the deserts of the Northern Territory and Western Australia; however, it is estimated that the remaining population – not including AWC sanctuaries – is around 8,000 animals.

AWC's contribution:

The Scotia population of Bilbies is estimated at more than 2,000 animals, while Yookamurra protects around 40 animals. AWC therefore protects around 20% of the world population of the Greater Bilby.

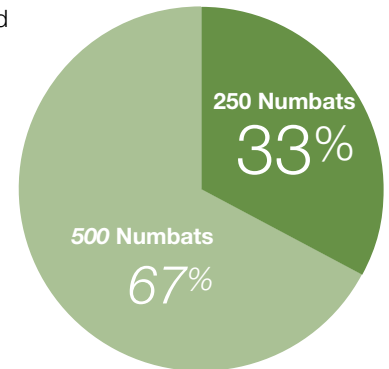


Numbat

The Numbat once ranged across much of southern Australia from western NSW and Victoria to Western Australia, extending as far north as the southern portion of the Northern Territory. By the 1980s it had disappeared from almost its entire range, surviving only in small fragmented populations in south-western Australia. The primary driver of its disappearance has been predation by foxes and cats. Numbats are unusual for Australian mammals in that they are diurnal, being active only during hot days and sheltering at night in tree hollows, fallen timber or burrows. The Numbat has been reintroduced at AWC's Scotia and Yookamurra sanctuaries.

Population outside of AWC properties: The Numbat population outside of AWC reserves is estimated at 500.

AWC's contribution: The Numbat population at Scotia is conservatively estimated at 225 (the largest population in Australia), while at Yookamurra the population is estimated at 25. AWC therefore protects approximately 33% of the entire Numbat population. After the Mt Gibson Endangered Wildlife Restoration Project is implemented, AWC will protect around half of the world population.

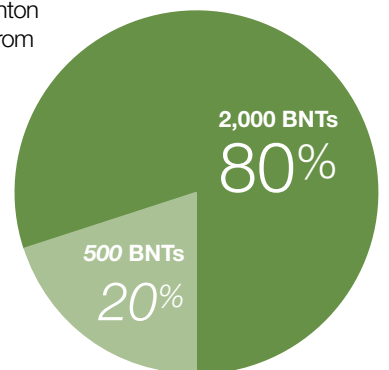


Bridled Nailtail Wallaby

The Bridled Nailtail Wallaby was presumed extinct until it was rediscovered in 1973 at what is now Taunton Scientific Reserve, near the town of Dingo in central Queensland. It was once widespread, extending from the Murray River region of western Victoria through central-western NSW and as far north as Charters Towers in Queensland. It is one of the more beautiful wallabies, with a distinctive white stripe running across its shoulders and back. The combined effect of habitat loss (land clearing) and feral predators pushed the Bridled Nailtail Wallaby to the brink of extinction – it was not sighted between 1937 and 1973 – and it is now found only in four wild populations: three in Queensland and AWC's Scotia Wildlife Sanctuary.

Population outside of AWC properties: The three Queensland populations have declined to an estimated 300–500 animals.

AWC's contribution: Our most recent estimate for the wild Scotia population is over 2,000. AWC therefore protects over 80% of the world population.



Responding to the wildfire challenge



Dropping aerial incendiaries as part of a defensive burn in response to wildfire

S.Legge

Across our northern sanctuaries, AWC staff have faced serious wildfires in late 2012. Our ability to respond effectively – protecting key habitat for threatened wildlife – demonstrates both the success of our prescribed burning program and the value of having around 80% of our staff based in the field. In the article below, Dr Sarah Legge (AWC National Science and Conservation Manager) describes how the Mornington team responded to one of several fires which recently threatened the sanctuary.

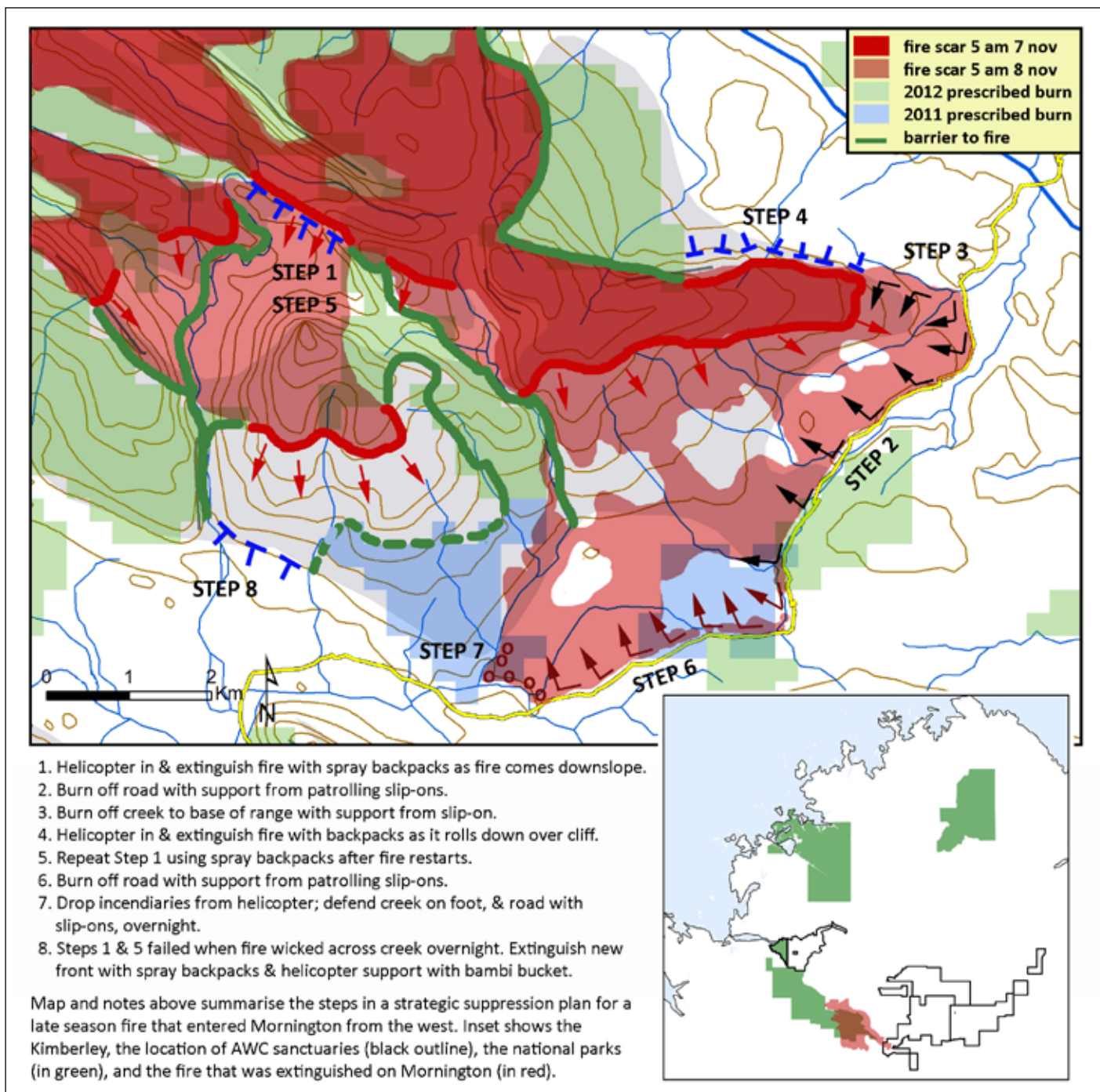
In early November, a small group of people gathered at the base of a sandstone ridge in the southwest corner of Mornington, checking gear and each other several times in the pre-dawn light. Tongues of fire flared up periodically from the steep slopes above. This was the last front of a wildfire that had just crossed our boundary from the adjacent national park. We'd been working on it, and successfully taming it, for several days. Everyone was tired now, but excited – we could sense victory this morning.

Wildfire really does feel like a cunning and devious creature that needs to be outsmarted and outlasted. This particular firefighting effort had progressed well; we'd made a strategic suppression plan after initially inspecting the fire from a helicopter a few days earlier. The plan involved putting some fronts out by dropping people with spray backpacks into inaccessible places by helicopter, plus burning defensively off existing tracks and some creeks. Slip-on units were used to deal with the spot-fires that inevitably jumped the track or the imperceptible creeping fires that insinuated themselves across the leaf litter in the creekbeds.

Confronting the fire

On this final morning, after lugging ourselves and as much water as we could carry in spray backpacks and containers up the polished rocks of the King Leopold Ranges to the active front, we split into pairs and began to systematically work along the front, moving downwind. You get into a satisfying rhythm fighting a grass fire: one person cools the flames with water sprayed from the backpack, the second person uses the 10 second reprieve from the withering heat to move in and deliver a death-punch with a leafy branch or a wet rag to kill the fire. You walk on a step or two, and repeat. You think of the small mammals, reptiles and birds whose habitat you are saving.

As the dawn breaks, the temperature rises to over 40 degrees and the wind starts to build. Getting near the front becomes harder and the front starts to travel faster. At this point, the helicopter comes into its own, not only by slinging barrels of water to the firefighters so they can recharge their spray backpacks, but also by discharging water along stretches of the front with the bambi bucket. The aerial water bombing, if used intelligently, turns difficult fire situations into easy ones. Sections of front are successively all but extinguished; the people on the ground follow



the water, squashing any small fires with the temerity to still burn, and mopping up any potent embers and logs.

By mid-afternoon and after 12 hours of strenuous work in the hot, smoky air, we finally had the front extinguished. We were spent, body and soul, but happy. However, whilst nursing tired limbs and thick tongues, filling hungry bellies and (prematurely) swapping tales of heroism, the fire flared up again. It would take another 12 hours, working through the night, to suppress it; this is very common – a smouldering log or a wind-blown ember finds fresh fuel and the fire goes again. It's why patrolling a fire-line for days after extinguishment is so important, and in some ways it's the hardest part of firefighting – the front is out, the adrenalin is gone, you're bone-weary and you want to find a cool dark corner to curl up into – but you have to stay alert, and often, get up, go back to the front and start again.

Why fight fires?

Given the effort involved in extinguishing a wildfire, it's reasonable to ask – why do it? The short answer is that wildfires are bad for wildlife because they typically remove over 90% of all vegetation in their path, meaning that animals are left without adequate food or shelter and, significantly, are vulnerable to predation, including by feral cats.

Our fire management strategy relies on prescribed burning (which removes far less vegetation, leaving a patchy mosaic of burnt and unburnt country) as the primary tool to influence fire patterns and reduce the risk of wildfires. Prescribed burning exerts a strong impact on overall fire patterns by changing the seasonality, the size, the intensity and the frequency of fires to more benign regimes; prescribed burning also reduces the extent and frequency of late season fires. However, it is rarely possible to eliminate this risk altogether: some wildfires will still occur and, at the wrong time and place, they can undo a lot of good work by threatening key habitats or consuming large swathes of country. Strategic intervention to suppress these fires contributes substantially to protecting wildlife and meeting our landscape-scale goals for fire management. Fire suppression is therefore an essential part of an integrated approach to fire management.

If prescribed burning has been effective, not all wildfires will need to be suppressed: for example, of the 25 unplanned fires that started in or near the AWC sanctuaries in northern Australia between July and November this year, we responded to just 10. In the case of the other 15 fires, combinations of topography, impending rain, and – critically – the spatial juxtaposition of fire scars from earlier prescribed burns, meant the unplanned fires were unlikely to cover large areas.



Dan Swan and Richard Faulkner tackle the fire with spray backpacks

S. Legge

Unplanned fires start for a variety of reasons. Lightning in storms during the transition between the dry and wet seasons is responsible for some ignitions, but most wildfires are started by people such as mustering contractors operating in the region, campers, travellers, and roadworkers. Some of these anthropogenic fires are a result of mere carelessness but others reflect a gross negligence and a lack of regard for the consequences of wildfire. Fires started by people require suppression more frequently than fires started by lightning, as the latter are more likely to occur when there is rain nearby in space and/or time.

The ingredients for successful firefighting

Having access to firefighting equipment – spray backpacks, slip-on units, rakehoes, a grader for creating cleared lines to burn off and helicopters for surveillance, reaching inaccessible areas and water bombing – is important in successful firefighting.

But equipment is not the sole ingredient. Fighting fires in the absence of a well-planned and executed prescribed burning program is extremely difficult because the reduced fuel loads in the prescribed fire scars are critical for curbing the rapid expansion of wildfire fronts, controlling the potential direction of wildfire spread and giving firefighters "home bases" to work towards. In addition, successful suppression depends on a considered and thoughtful suppression plan, which in turn depends on an intimate knowledge of topography, the spatial arrangements of fuels, the weather patterns and historical fire behaviour under different conditions. Fighting a fire is about being in the right place at the right time.

As this edition of *Wildlife Matters* goes to print, our staff in northern Australia eagerly await the first significant rains which will signal the end of their wildfire season. For our staff in central and southern Australia, it will be a long hot summer.



Defensive burning off road

S. Legge

Australia's largest feral herbivore-free area



Chris and Melissa Whatley building the fence at Wongalara

P.Rae

In late September, as the Top End temperatures began to climb, Chris Whatley and his team at Wongalara were completing the final stages of a 160 kilometre fence which will protect more than 1,000 square kilometres of tropical woodlands, wetlands and rich riparian habitat from feral herbivores. It was an historic moment: for the first time in over a century, a significant area of land in the Top End will be free of large feral animals such as buffalo, cattle, horses, donkeys and pigs.

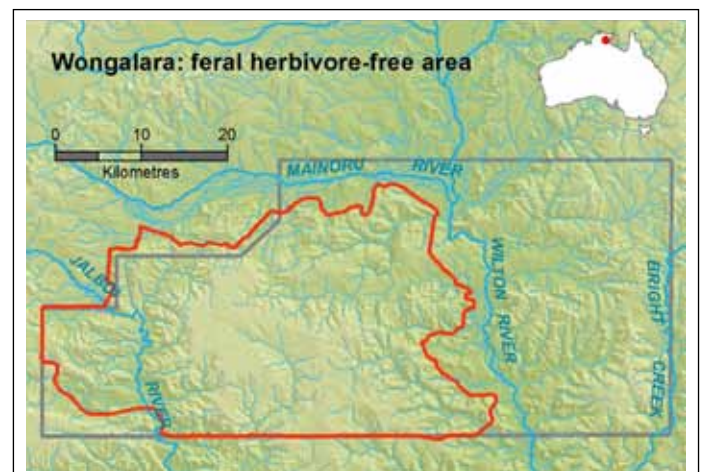
The Wongalara fence will do more than just exclude feral herbivores: it will help us “turn back the clock” to a time before the invasion of feral herbivores dramatically changed the structure and integrity of Top End habitats. AWC will be measuring the recovery of habitats and wildlife on Wongalara through an extensive network of more than 50 biological monitoring sites. With several years of baseline data already collected – and with matched sites located within and outside the feral herbivore-free area – the project will generate important scientific knowledge about the role of feral herbivore control in the recovery of wildlife in northern Australia.

Regular readers of *Wildlife Matters* will be aware that AWC has already established a 50,000 hectare feral herbivore-free area at Mornington in the central Kimberley. The exclusion of feral herbivores at Mornington generated a doubling of small mammal numbers and increases in the abundance of many reptile and bird species, as well as other ecological benefits. Our aim at Wongalara is to replicate this success. The location is particularly significant, being 120 kilometres from Kakadu National Park, which has experienced a 75% decline in small mammals in little more than a decade.

In seeking to replicate the outcome witnessed at Mornington, we are conscious of the fact that the Top End has endured higher densities of feral herbivores for a longer period than the Kimberley. It is therefore possible that any ecological response to destocking will take longer or will be more subdued. For example, it is possible that the impact of feral cats will be greater in the Top End (their hunting is probably more efficient when feral herbivores have simplified and reduced ground cover, which provides food

and shelter for many native animals). For this reason, we have also established several experimental cat-free enclosures at Wongalara. This will help us isolate the role of cats in limiting the recovery of the Top End's native fauna and better understand the interaction of cats with feral herbivores.

Within weeks of completing the fence at Wongalara, we had removed over 1,000 feral herbivores from inside the fenced area. A good wet season now will kick-start the process of recovery, generating a new burst of vegetation growth that, for the first time in more than a century, will not be taxed by feral herbivores. Australia's largest feral herbivore-free area is set to play a critical role in helping reverse the decline of small mammals in northern Australia.



Measuring ecological health



AWC intern Andrew Morton checks traps at Newhaven

J. Winnel

One of the distinguishing features of AWC's approach to conservation is our commitment to measuring the ecological health of our sanctuaries. A robust, science-based framework for tracking health is essential – the data enables us to continuously evaluate and improve our land management and in turn helps to maximise the ecological return on your investment. In other words, our ecological health metrics describe how your financial capital is being utilised to restore and enhance the natural capital in our sanctuaries.

AWC's Ecological Health Measurement Framework requires an annual assessment of key indicators which, in combination, tell us whether a sanctuary is in good health. This encompasses – but is broader than – an assessment of management effectiveness. Our ecological health framework requires that we measure indicators in three categories:

- Threats
- Species
- Ecological processes

In the case of species, our goal is to ensure that the biodiversity (native plant and animal species) present on a sanctuary is intact; this includes retaining the species extant at acquisition and, in some cases, restoring (reintroducing) species that have been lost from that landscape in the last 200 years. At each sanctuary we select a suite of species to measure which in combination helps us evaluate whether our species goal is being met.

For each indicator species, we select a "target" which on the basis of available information, we believe represents a "healthy" state. In some cases, this target is specific (e.g. at Faure Island, the target for Western Barred Bandicoots is at least 2,000 animals). If we have insufficient information to set a specific target, we may set an interim target such as maintaining the population index at or above our baseline measure (e.g. Banded Hare-wallaby on Faure Island).

The challenge of variable rainfall

One of the key challenges in applying this framework is setting targets and interpreting annual results at those sanctuaries which have unpredictable and highly variable rainfall patterns: for example, arid zone sanctuaries such as Newhaven. Rainfall is a key system driver in the arid zone but recurrent rainfall patterns are defined on a decadal scale rather than annually (contrast northern Australia, which has a comparatively stable annual pattern of wet and dry seasons).



Central Netted Dragon

A. Morton

A clear example of the influence of rainfall on our measurement of ecological health in the arid zone is the trend in mammal abundance at Newhaven. Figure 1 shows the total annual rainfall recorded at Newhaven from 2007-2010. Figure 2 shows the average number of mammal species trapped per site during annual Newhaven fauna surveys from 2008-2011 and Figure 3 shows the average number of individuals. It is clear that there is a relationship between mammal richness and abundance and total rainfall in the previous year.

Our data at Newhaven is consistent with the fact that rainfall is a key influence on mammal abundance in many arid systems. In interpreting the data, our challenge is to disentangle the effect of rainfall from the effect of our land management. Only over time, as we collect more data, will we be able to distinguish between the increase in response to rain and any increase in response to our land management, such as an improvement in fire management outcomes. In any event, we will need to set mammal targets at Newhaven which take into account the natural (annual) fluctuations in response to rain.

For other species indicators at Newhaven, rainfall appears to have little effect. For example, diurnal reptiles have shown a gradual increase in species richness (Figure 4) and abundance (Figure 5) each year, irrespective of rain. It's too early to be definitive but it appears that reptiles are influenced more strongly by drivers other than rain: in this case, it is likely the increase is partly due to increasing vegetation cover with time-since-fire (i.e. fire management).

By collecting long-term annual data sets, AWC is in a unique position to look at population trends over time and how they are influenced by environmental variables such as rainfall. This will give us the information needed to refine our indicators and targets, improve our understanding of what drives ecological health and continually assess and improve our land management strategies.

Newhaven Rainfall

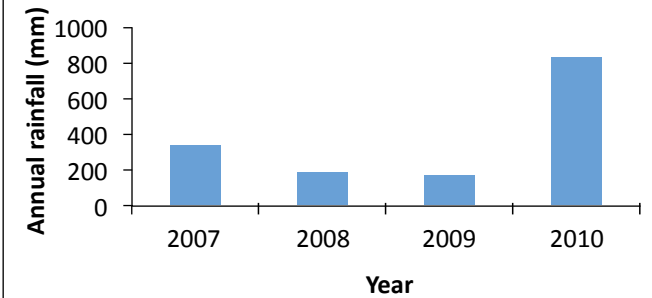


Figure 1

Mammal Richness

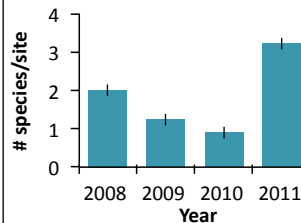


Figure 2

Mammal Abundance

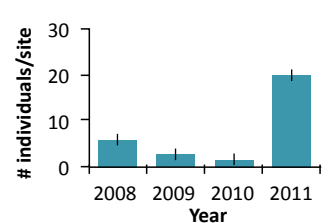


Figure 3

Reptile Richness

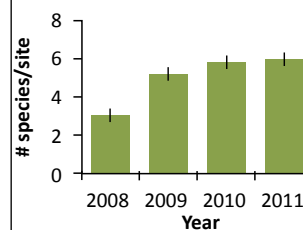


Figure 4

Reptile Abundance

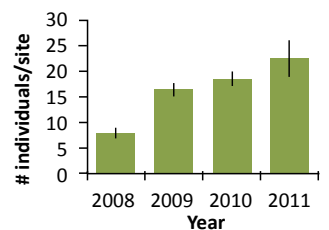


Figure 5



Leaving a legacy for conservation

NEWSLOCAL
Manly Daily



Kathleen Hunt (above) sold her apartment (left) to conserve wildlife.

Kathleen's legacy

THE Balgowlah apartment of animal advocate, the late Kathleen Hunt, sold at its September 1 auction for \$540,000 through Cunningham Bond Estate.

At Ms Hunt's bequest, all proceeds will go to Australian Wildlife Conservancy for the protection of species and their habitats.

Ms Hunt, a former Manly Girls High School teacher and retired in 1960, was extremely fit and regularly walked from her unit at Condensine St to Manly or Warringah Mall into her late 90s. AWC said the legacy would ensure her "intrepid spirit" would burn brightly.

Kathleen Hunt

On 2 January 2011, Kathleen Hunt passed away at Palm Grove Nursing Home in Sydney aged 105. AWC had lost our oldest supporter and a passionate advocate for Australia's wildlife. Arriving in Australia from England in 1913, Kathleen's first three decades in her adopted country coincided with the extinction of several Australian mammals including the Tasmanian Tiger (1936) and the Toolache Wallaby (1939). Several other animals would become extinct during Kathleen's lifetime including the Lesser Stick-nest Rat and the Paradise Parrot. Around the same time that Kathleen retired from teaching at Manly Girls High School in 1960, the last Lesser Bilby – the AWC logo – quietly passed away somewhere in central Australia.

Kathleen had a great love of the Australian outback. She was an intrepid traveller, camping with the Sundowners Camping Group until well into her 80s. Even in her 90s, Kathleen often walked from her Balgowlah home to Manly or Warringah Mall. Her love of Australia's wildlife and wild places – and her dislike of feral cats and foxes - never ceased. Kathleen was determined to leave a legacy in the hope that AWC could help ensure no more Australian animals disappeared forever. Kathleen's generous bequest will guarantee her contribution to the protection of Australia's threatened animals continues long after her passing. Kathleen's ashes are now at Scotia – the largest feral predator-free area on mainland Australia – where she will rest in peace surrounded by her beloved Bridled Nailtail Wallabies, Greater Bilbies and many other threatened species.

Max and Dorothy Head

Max and Dorothy met at a naturalist club meeting more than 40 years ago. They would be together for the rest of their lives. Among other things, they shared a great love of nature and photography. For both of them, this meant a lifetime committed to helping protect Australia's fauna and flora.

Max and Dorothy were among the very first supporters of AWC. As such, they shared a special bond with the organisation and were proud to have watched as the organisation grew and as our efforts delivered increasingly important results for some of Australia's most endangered wildlife.

Max and Dorothy chose to make a bequest to AWC because they believed that a bequest represented the best way for them to leave a lasting legacy for the benefit of Australia's wildlife. They chose to have their ashes scattered at AWC's first sanctuary – Karakamia – surrounded by towering Jarrah and Marri trees. AWC will honour their memory – and their shared love of nature – by ensuring their bequest makes a difference where it really counts: in the field at places like Karakamia.



Making a bequest

For information on making a bequest to AWC, please contact Beth Reid in our Perth office (08 9380 9633) or Leah Royle in our Sydney office (02 9324 4209) or visit www.australianwildlife.org

AWC joins forces with Google to showcase our conservation work



AWC has joined forces with Google to develop two innovative mapping products that highlight the scope of AWC's on-ground conservation work across Australia. Both products were unveiled at a special Sydney launch of Google Earth Outreach, where AWC Director Tim Flannery delivered the keynote address.

The first AWC/Google product is a virtual tour of AWC sanctuaries that showcases our fight to turn back the tide of extinctions in Australia. It takes the viewer on a journey to several AWC sanctuaries – from Brooklyn to Scotia to Faure Island and more – highlighting the remarkable diversity of ecosystems and wildlife that we protect and presenting the scale of our on-ground programs including feral animal control and fire management.

The second product visualises the effects of high-intensity fires on Australia's savanna ecosystems and wildlife. It illustrates, through animation and Google's stunning mapping technology, the success of AWC's award-winning EcoFire initiative in reducing the extent of wildfires in the central Kimberley.

AWC is proud to be working in partnership with Google. Google Earth Outreach, the product launched by Tim Flannery, has been developed to support non-profit organisations and communities around the world by applying Google's mapping tools to help address key environmental and sustainability issues.

Google's products and technology will help AWC enormously in our core business – delivering practical land management, informed by the best available science. In addition to boosting our operational capacity, Google's tools also help us connect with people across Australia, promoting awareness and building support for the actions needed to reverse our extinction crisis.

Go to our website to view both AWC/Google mapping products via YouTube and/or download the files to take the tours in Google Earth:

<http://www.australianwildlife.org/News/AWC-and-Google-Earth-develop-a-virtual-tour-of-AWC-Sanctuaries.aspx>

Optus and AWC set to launch new social media pilot project



AWC and Optus are set to launch an exciting, interactive Facebook game called *My Wildlife Sanctuary*. This innovative pilot project aims to test the effectiveness of social media to raise awareness about Australia's unique animals and the work of AWC to save threatened wildlife and habitats.

Players will be able to build a virtual sanctuary that attracts native Australian wildlife and create a virtual Field Guide as they go. Each new species unlocks a fun mini-game where players can share news about animals attracted to their sanctuary and even compete with their Facebook friends online. As the game progresses, players learn about Australian wildlife and have the opportunity to support our work in the field to save real threatened wildlife. This is an exciting first step in testing the potential of social media to help raise awareness and support for conservation. Watch our website for the launch date!





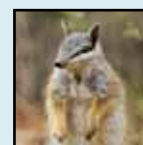
Feral cats

☐ Please direct my donation to AWC's strategy to reduce the impact of feral cats



Mt Gibson Endangered Wildlife Restoration Project

☐ Please direct my efforts to the establishment of the largest feral predator-free area in Western Australia



AWC operations generally

☐ Please direct my donation to AWC operations around Australia

Name: Dr/Mr/Mrs/Ms _____

Address: _____

Suburb: _____ State: _____ Postcode: _____

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: _____ Date: _____

Printed Name in Full: _____

Bequests

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

Information

☐ Please send any news or information by email

☐ 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:

- 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).
- Where the due date falls on a non-business day, the drawing will be made on the next working day.
- We will not change the amount or frequency of drawings arrangements without your prior approval.
- 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.
- We will keep all information pertaining to your nominated account at the Financial Institution, private and confidential.
- We will promptly respond to any concerns you may have about amounts debited to your account.
- We will send a receipt within 45 days of the conclusion of the financial year summarising your entire year's gifts for tax purposes.

Your Rights:

- 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 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.
- You may stop payment of a monthly donation by giving written notice directly to us (PO Box 8070 Subiaco East 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.
- 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.
- 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:

- 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.)
- 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.
- It is your responsibility to advise us if the account nominated for transactions with the Australian Wildlife Conservancy Fund is transferred or closed.
- 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.
- 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.)

