



wildlife matters

australian



wildlife
conservancy

Winter 2011



Delivering effective
conservation in
the field

Saving Australia's threatened wildlife



Welcome to the Winter 2011 edition of *Wildlife Matters*. I hope you will enjoy reading about our progress in the following pages – with your support, we are continuing to develop and implement a new model for conservation which delivers measurable results where it really counts ... *in the field*.

There are limited resources available for conservation in Australia. Unfortunately, we also have a very limited period of time within which to provide a secure future for many species that are in rapid decline. Feral animals, altered fire regimes and other immediate threats will cause a suite of extinctions in the next 10-20 years if we do not take decisive action now.

Accordingly, if we wish to provide a secure future for Australia's wildlife, it is vitally important that we invest available resources where they will deliver the highest ecological return. This may sound like common sense but, in practice, there is very little measurement and reporting of results ("returns") in the conservation sector. In the absence of information about ecological returns, there is a risk that decisions about resource allocation in the conservation sector will continue to be made on a basis that is not rational (in the sense that we will not get the best "bang" for our conservation dollars).

AWC is addressing this issue by developing and applying a framework for measuring ecological health across our sanctuaries. While we are still in the "roll-out" phase, the results reported in this edition of *Wildlife Matters* reflect our commitment to measuring the ecological outcomes delivered by our on-ground land management.

I am pleased to report that recent returns have been positive and, in many cases, exceptional. At one extreme, small mammal numbers at Newhaven have increased over the last 12 months by **over 1500%**. Try finding a fund manager who can deliver that kind of return for you! However, as you will read on page 9, the result at Newhaven has been driven by near-record rainfall which has fuelled a temporary "small mammal boom". As the country dries out, mammal numbers will fall. This highlights the need to interpret our ecological returns in context; to adjust for seasonal factors; and to consider results over an ecologically meaningful time frame. Our aim is to ensure that the trend in small mammal populations at Newhaven, adjusting for seasonal variations, is positive ("healthy") compared both to our baseline data and to regional indicators.

Other examples of strong ecological returns reported in this edition include our Bridled Nailtail Wallaby population at Scotia and our Bilbies and Boodies at Yookamurra. Underpinning these results, and similar results across our other sanctuaries, is AWC's commitment to active land management (including in relation to fire management and feral animal control) and our investment in science (such as our work with partners in addressing the feral cat crisis).

With around 80% of our staff in the field, we are well placed to ensure your generous support is translated into practical on-ground results. Thank you again for helping AWC make a real difference.

Yours sincerely



Atticus Fleming
Chief Executive

PS. Under the Bilby Challenge (see page 3), your gifts to AWC will be matched (50%) by a generous supporter.

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 22 sanctuaries covering over 2.6 million hectares (6.5 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, more than 90% of AWC's total expenditure was incurred on conservation programs, including land acquisition. Less than 10% was allocated to development (fundraising) and administration.

Cover Photo: Yellow-footed Rock Wallaby at Buckaringa Wildlife Sanctuary.
(photo: Wayne Lawler)

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A secure future for the Bridled Naitail Wallaby



Bridled Naitail Wallabies at Scotia Wildlife Sanctuary.

W.Lawler

Scotia Wildlife Sanctuary is now home to more than 1,000 Bridled Naitail Wallabies. This represents over 80% of the entire population of this nationally threatened species, highlighting the vital role of AWC in saving one of Australia's most beautiful macropods from extinction.

Current status of the Bridled Naitail Wallaby

The Bridled Naitail Wallaby was presumed extinct until a small colony was rediscovered in central Queensland in 1973. It currently survives in the wild at four locations:

- Taunton National Park, Qld (50-100 animals),
- Idalia National Park, Qld (50-100 animals),
- Avocet Nature Reserve, Qld (50-100 animals),
- Scotia Wildlife Sanctuary, NSW (approximately 1,000 animals).

The populations in Queensland are small and precarious: they are not increasing. A key limiting factor for each of these populations is predation by foxes. In contrast, the large population at Scotia clearly demonstrates the value of establishing a feral-free area. The overall size of Scotia is 64,653 hectares: in the northern half of the property, AWC has created a feral-free area of 8,000 hectares into which seven threatened mammals, including the Bridled Naitail Wallaby, have been reintroduced. The complete absence of feral predators has allowed the Bridled Naitail Wallaby population at Scotia to increase substantially, providing a high level of confidence that the species will not become extinct even if the three other wild populations disappear.

Expanding the population at Scotia

While the establishment of a feral predator-free area (surrounded by a fox and cat-proof fence) has been an essential step in securing the species, our ultimate objective is to establish a sustainable population of the wallaby in the unfenced section of Scotia. The unfenced areas could support an increase in the Scotia population to several thousand animals. To this end, our field staff (led by our feral animal control expert, Tony Cathcart) have implemented an intensive baiting regime to suppress fox numbers in an area of suitable unfenced habitat on Scotia. An initial trial release of male wallabies has been carried out. The results of this trial have been mixed: a majority of individuals that stayed within the intensively managed area survived; however, most of the individuals that travelled into areas of higher fox densities were predated or are unaccounted for. We are now planning a second trial with modifications to the release protocol to promote site fidelity – eg, this will be a mixed sex release to stop the males travelling long distances (into fox country) in search of females!

The Bridled Naitail Wallaby illustrates clearly the importance of feral predator fencing: it is a vital tool in saving species from extinction. However, AWC is also looking “beyond the fence” – designing strategies that, based on good science and active on-ground management, will allow us ultimately to re-establish populations of the Bridled Naitail Wallaby and other species across the landscape.

The Bilby Challenge: matching your gifts to AWC



Lesser Bilby.

P.Schouten

Please help AWC provide a secure future for species like the Bridled Naitail Wallaby. Under the Bilby Challenge, 50% of every gift to AWC in June 2011 will be matched by a generous AWC supporter! More background to the Bilby Challenge – named after the Lesser Bilby, which is the AWC logo – is on our website: www.australianwildlife.org



AWC Ecologist, Matt Hayward, releases a Bridled Naitail Wallaby.

J.Cathcart

Confronting the feral cat crisis

Regular readers of *Wildlife Matters* will be aware there has been a dramatic collapse in the small-medium sized mammal fauna of northern Australia. Some of the most compelling evidence comes from Kakadu National Park, where small mammal populations have dropped by more than 75% in the last 15 years. AWC and our partners are leading the way in efforts to find strategies for reducing the catastrophic impact of feral cats, one of the key factors driving this faunal collapse in our north.

The feral cat challenge

The number of feral cats in Australia is estimated at between 12 and 19 million. Cats are relentless predators: examinations of stomach contents in the Kimberley indicate that individual cats eat up to a dozen mammals, birds, reptiles and frogs every day. Multiplying overall cat numbers by their daily intake suggests that the impact of their predation on our native fauna is prodigious.

Based on our research in the Kimberley, AWC estimates that feral cats kill at least two million native animals every day in northern Australia (ie, in the northern one-sixth of the continent).

Cats are also perhaps the most difficult introduced animal to control. They are highly secretive and extremely cautious, making them very difficult to catch (whether the purpose is control or to carry out research) or bait (they are live prey specialists, and avoid meat baits). Without knowing more about their basic ecology - including their habitat preferences, ranging behaviour and interactions with other predators (Dingos) - strategies to reduce the impact of cats are severely handicapped.

In an attempt to unlock the secret to effective cat control, AWC is working with our partners to:

- quantify the impact of cats on native fauna (mainly at Wongalara, near Arnhem Land); and
- identify ways of managing landscapes to reduce the impact of cats (most of this work is occurring in the Kimberley).



Wongalara: quantifying the impact of cats

Wongalara is located around 100 kilometres from Kakadu, in the geographic heart of the mammal declines. The density of native mammals at Wongalara is, like Kakadu, very low and has remained low despite active land management by AWC including the removal of thousands of introduced herbivores (feral cattle, buffalo, horses and donkeys) and improved fire management. This suggests that feral cats may be preventing Wongalara's native mammals from recovering. If so, then mammal recovery across large parts of northern Australia will be hampered, even if fire and introduced herbivores are adequately managed, because of the presence of feral cats.

To test this hypothesis, we are constructing a set of experimental fenced areas (25 hectares each) at Wongalara for a small mammal reintroduction experiment. Pale Field Rats (a native rodent that has disappeared from large tracts of north Australia) will be reintroduced both into fenced areas from which all cats have been removed and into "control" areas from which feral cats are not excluded.

In total, 120 Pale Field Rats will be reintroduced to Wongalara. They will be sourced from an island off the Northern Territory coast. In preparation for this translocation, a "trial" translocation was carried out in April, led by Mary-Anne Collis (PhD student) with support from all research partners, especially the Northern Territory government. Twenty rats were airlifted from Quoin Island to the Territory Wildlife Park in Darwin. The trial is allowing us to test each step of the translocation process in great detail, from optimising the design of transportation boxes, to diet, to designing a fence that will prevent rats escaping from the reintroduction plots.





Bruce, a feral tomcat.

H.McGregor



Sugar Gliders are preyed on by feral cats in northern Australia.

S. Murphy

As this newsletter goes to print, the fenced areas at Wongalara are under construction and fauna surveys are being carried out to establish baseline reptile and mammal numbers before the experiment begins.

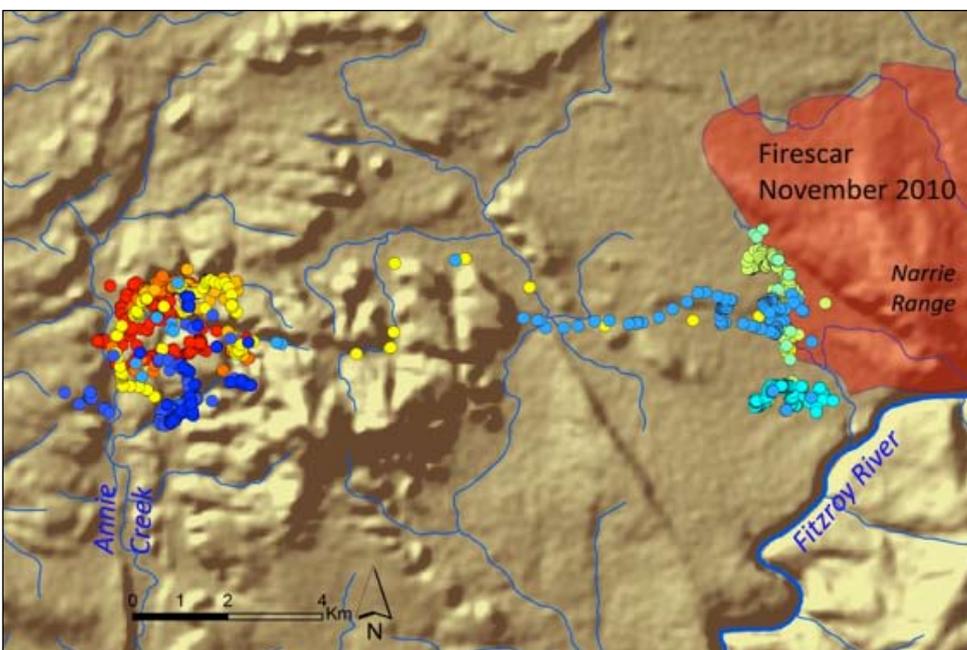
Kimberley: landscape scale cat control strategies

Given the difficulties in trapping and baiting feral cats, we need to develop new strategies to minimise the impact of feral cats across the landscape. To this end, we are carrying out research on two potential strategies:

- Can we use a larger predator (Dingos) to control a smaller predator (feral cats)? This work was reported in the previous issue of *Wildlife Matters* (and the answer is yes, because cats avoid areas where Dingos are common).
- Can we manipulate fire and grazing in a way that reduces the hunting efficiency for cats? Both fire and grazing strongly influence the structural complexity of savanna woodlands. In a simple example, frequent fire and heavier grazing reduce the cover available to native animals, potentially exposing them to higher predation. We are examining this question in the Kimberley at Mornington Wildlife Sanctuary.

If we want to manage landscapes in a way that disadvantages feral cats, we need to understand how feral cats use the landscape in great detail, and how this is influenced by fire and introduced herbivores. Recent technological advances in telemetry equipment mean that we can now use programmable GPS collars on cats instead of standard radio-collars. No more toiling around the scrub for hours to get one data point every day or so (which often doesn't tell you a whole lot)! The GPS unit on the cat's collar collects position data at a rate which we can modify remotely – this means we can change the fix rate (eg, from twice a day to once every 10 minutes) if an event occurs – like a fire near the cat's home range – and we want to know exactly how the cat reacts. The data on the collar can also be downloaded remotely, which means we can examine the cat's ranging behaviour 'at will' and modify the position fix rate accordingly.

The map (below) is an example of the insight offered by this approach. Bruce was a strapping feral tomcat that Hugh McGregor (PhD student) collared late last year at Mornington. Each dot on the map is a single positional fix for Bruce, stored on his collar. The dots are colour-coded to display a time series from red (earlier fixes) through orange, yellow, aqua to blue (later fixes). Bruce's home range was a three kilometre wide area in



Bruce's Odyssey.

Late in 2010, Bruce responded to an intense fire 14 km away by leaving his home range to hunt along the edge of the firescar for a fortnight, before returning back home. Each dot is a position fix for Bruce, logged at variable intervals (from every 15 mins to every two hours) over a six week period. The time series begins at red, moves through orange, yellow, aqua and then blue.



Tracking the activity of feral cats in Northern Australia.

K. Tuft

the Annie Creek catchment. During the time that Bruce was collared, a lightning strike ignited a fire on the Narrie Range, 14 kilometres away (given the time of the year, this was a hot, intense fire). Not long after the fire, Bruce made a daring two-day journey, presumably skulking through the territories of several other cats, to spend a couple of weeks hunting along the edge of the Narrie Range firescar, before retracing his steps back to home turf. To offset the risk of such a journey, the hunting along the edge of a firescar must be especially lucrative, relative to what Bruce could achieve in his home territory.

Hugh has collared another nine cats in the past two months, and in each case we have carried out a prescribed, early dry season burn (ie, a cool, less intense burn) in or near the cats' territories, to see if they respond to a "cool" fire in the same way as Bruce responded to a "hot" fire. Although it's still too early to make a call, our preliminary data downloads suggest the cats are not using the firescar edges of the "cool" fire. This intriguing difference between the cats' reaction to a "cool" fire and their reaction to a "hot" fire could be the key that helps offer a management solution to the impacts of cats.

Bruce made his odyssey in November, in response to a late dry season fire. Such fires are very thorough – covering a large area, and leaving very little unburnt vegetation as habitat refuges within the firescar. In contrast, a prescribed burn in the early dry season is small, and generally leaves almost half the vegetation within the firescar intact. Our previous research (on Red-backed Fairy-wrens, small mammals and reptiles) shows that animals can stay in their home ranges if they are affected by an early dry season fire; however, they need to move out of territories after a late dry season fire in order to find suitable habitat. In other words – the edges of late dry season fires (but not early dry season fires) may be where the cat 'gets the cream'. The increase in the incidence of late dry season fires across many parts of northern Australia in the past two to three decades may explain why feral cats are having a greater impact now.

At this stage, our hypotheses are speculative. However, the data we have obtained to date is extraordinary. As Hugh continues to collect data on how cats use the landscape in the presence and absence of fire and introduced herbivores, our ability to manage the landscape to reduce the impact of cats should be radically improved.

Sally has a student

Sally, our cat detection dog, has proved so useful for cat research and management that we have decided to train a second dog for the job. In June we collected a nine-week old puppy from a breeder in Darwin. The pup is a Catahoula Hound, descended from Spanish stock originally but developed in North America to be a medium range hound for tracking species like racoons, pigs and coyote. The breed has a reputation for being versatile with excellent scenting ability, and they are about the right size and conformation to withstand the harsh physical conditions of northern Australia. Sally has demonstrated the tremendous contribution that cat-detection dogs may play in unlocking some of the mysteries of feral cat behaviour, so we look forward to further enhancing our capacity with our new Catahoula recruit.



Our new cat-detection dog.

S. Legge

Stick-nest Rats airlifted to Mt Gibson



A Greater Stick-nest Rat is released at Mt Gibson.

R.Ellis

Stick-nest Rats airlifted to Mt Gibson

As a first step in the Mt Gibson Fauna Restoration Project, 39 Greater Stick-nest Rats have been airlifted from a remote island off the South Australian coast to their new home within a purpose built feral-free area at Mt Gibson Wildlife Sanctuary.

Once widespread across Australia, the Greater Stick-nest Rat disappeared from the mainland in the 1930s, primarily as a result of predation by foxes and feral cats and destruction of habitat by feral herbivores. Listed as threatened under Federal legislation, the only remaining natural population is in the Franklin Islands off South Australia. Its closest relative – the Lesser Stick-nest Rat – is extinct.

The historic cross-border operation was a collaborative effort involving the Federal Government and both the South Australian and Western Australian Environment Departments. The 39 Rats were captured on the Franklin Islands by South Australian officials: they were then transferred by helicopter to Ceduna, on the South Australian mainland, before being loaded on a charter plane which flew direct to Mt Gibson.

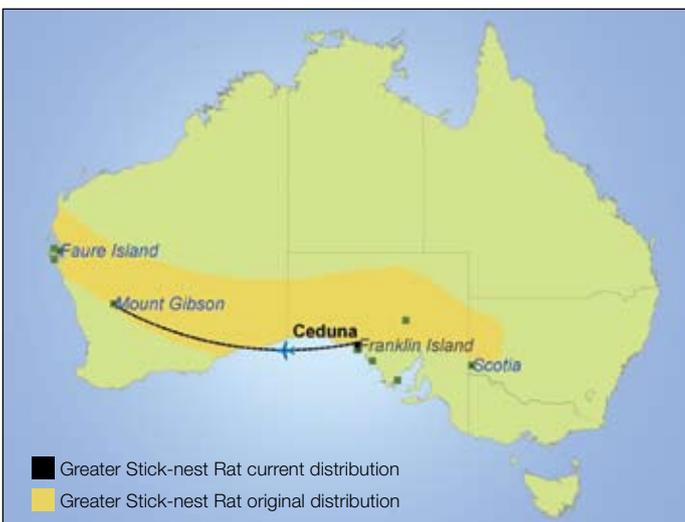
This massive logistical operation culminated in the release of the Rats – all in good health – into a five hectare area at Mt Gibson surrounded by a six foot high feral-proof fence. The area is ideal habitat for Stick-nest Rats, being dominated by Salmon Gums with an understorey of shrubs (including various chenopod species, the favoured food of the Rats). The new population is being monitored closely, with all signs

suggesting they remain in good condition and have adapted well to their new home. Sand pads and remote cameras are being used to monitor the site to help prevent any feral incursions.

The Mt Gibson Stick-nest Rats are the only population on mainland Western Australia and will play a critical role in preventing the extinction of one of Australia's most endangered mammals. AWC has also reintroduced Stick-nest Rats to Scotia (NSW), where they have bred successfully, and Faure Island, although the fate of the small Faure Island population remains unknown.

Stick-nest Rats are largely herbivorous, eating a variety of leaves and fruits of succulent plants, particularly of the nitre bush and chenopod varieties. The species' name refers to the large nests of interwoven sticks (up to one metre high and 1.5 metres wide) built by this animal for shelter. Pieces of vegetation are chewed off, dragged and woven together to form the nest which is often created around a shrub or fallen tree. Nests are generally added to by successive generations, and large nests may support up to 20 individuals.

The reintroduction of the Stick-nest Rats at Mt Gibson is a first step in our project to establish the largest feral-predator free area in Western Australia, with plans for an area of up to 8,000 hectares at Mt Gibson to be surrounded by a fox and cat-proof fence. Around 10 endangered mammals are set to be re-introduced including the Numbat, the Woylie and the Bilby.



Construction of the feral-proof fence at Mt Gibson.

L.Spence-Bailey

Historic native title consent determination at Newhaven

AWC has become the first non-government conservation organisation to enter into a native title consent determination with traditional owners. The historic determination recognises the native title rights of the Warlpiri-Luritja people in relation to Newhaven Wildlife Sanctuary.

In December 2000, five members of the Warlpiri-Luritja community filed an application for determination of native title over the 2,600 square kilometres covered by Newhaven. At the time, Newhaven was an operating cattle station. Ten years later, the Hon Justice Reeves presided over a special sitting of the Federal Court at Newhaven Wildlife Sanctuary to formally recognise the existence of native title across the property. It was an historic day, celebrated by representatives of the Warlpiri-Luritja community, the Central Land Council and the Northern Territory Government, as well as AWC staff.

Justice Reeves commented in his decision that **“the achievement of a settlement of a native title claim by agreement is to be encouraged and congratulated”**.

AWC is working toward native title consent determinations at other properties around Australia. In each case, our engagement with indigenous communities is designed to both secure the extraordinary conservation values of the property and facilitate the achievement of socio-economic aspirations by traditional owners.

Through our managers at Newhaven (Josef Schofield and Danae Moore), AWC has already built up a strong working relationship with traditional owners. During the last five years, we have collaborated on fire management and biological surveys, employing indigenous rangers to assist with a range of land management tasks. This combination of science and indigenous knowledge has helped deliver improvements to the ecological health of Newhaven and has promoted our understanding of the property’s biodiversity and management needs, as well as providing vital employment opportunities for the local community.

Newhaven lies at the Ngaliya Warlpiri and Luritja language community interface, and the consent determination recognises that native title is vested in five landholding groups, being a subset of these language communities. For the native title holders, Newhaven is a special place for bush food, such as native currants, and for bush medicine. There are also important places that need to be looked after. The landholding groups are connected to particular Dreaming tracks and clusters of Dreaming places and the lands that surround them. In his decision, Justice Reeves stated:

“According to the claimant’s beliefs the determination area was created and fashioned by their ancestors in the form of Jukurpa or Dreaming who imbued the countryside with their spirit essence and in some instances continue to exist in the country.”

For AWC, the formal recognition of native title is an important step in further developing our partnership with the Warlpiri-Luritja traditional owners as we work collectively to protect the ecological health of Newhaven.



AWC’s Danae Moore with JJ Spencer, traditional owner of the Yarpilangu region of Newhaven at the Native Title Determination.

J.Schofield



Justice Reeves and Member for Stuart, Karl Hampton (far right), with traditional owners from the Jipalpa-Winitjaru, Pikilyi, Yarpilangu-Karrinyarra, Watakinpirri and Winparrku landholding group.

J.Schofield

Fauna populations explode at Newhaven



Short-tailed Pygmy Monitor - the world's smallest goanna - was caught on the Newhaven survey.

D. Moore

High rainfall during the last 12 months has resulted in a massive increase in wildlife populations at Newhaven. With the desert in full bloom, this year's fauna survey recorded an astonishing tally of more than 3,200 captures. **The capture rate for mammals increased by more than 1500% compared to last year (from 88 to 1,381 mammals).**

Species that have been rare in previous surveys were plentiful in 2011, including the Desert Mouse and the nationally threatened Brush-tailed Mulgara. The most common mammal caught was the Sandy Inland Mouse which is known to boom in numbers after heavy rain. The Long-haired Rat, another irruptive species with the highest reproductive rate of any Australian rodent (producing up to 12 young every three weeks), was caught for the first time on Newhaven; this was especially significant because it hasn't been recorded around Alice Springs since 1974.

The Nyirripi Indigenous Rangers participated in the trapping, supported by a Central Land Council Indigenous Ranger Coordinator, and gained experience in undertaking large scale biological surveys. The Rangers were also the mainstay of the track survey team. Our annual track surveys provide data on the distribution of predators and other species that are not typically recorded in the trapping survey. Across the network of one hundred permanent two-hectare tracking sites, fresh fox tracks were recorded at 15% more sites than in 2010 (indicating that the boom times also result in an increase in feral predator activity). We also observed higher numbers of tracks of Bustard, Red Kangaroo and Euro, which are all considered locally uncommon.

Although hampered by rainfall and muddy tracks, the bird survey team were delighted by the large numbers and diversity of birds. The ephemeral lakes had dried out, so waterbird numbers were

down, but the team counted large numbers of bush birds (especially Woodswallows, Budgerigars, and Diamond Doves), detected vagrant species including the Freckled Duck, and recorded locally rare birds like Black-eared Cuckoo and Singing Bushlark. The Spinifexbird was sighted at many locations, yet in previous surveys the species had only been recorded from one very small area on the property. Species that had not been 'formally' confirmed before included the Square-tailed Kite, Red-chested Button-quail and White-browed Woodswallow.

Fire management

Extensive fire is a heightened risk following the luxurious grass growth of the past year, making careful fire management on Newhaven more critical than ever. From May onwards, prescribed burns are being carried out from the ground as well from the air (using aerial incendiaries dropped from a helicopter) to create strategic firebreaks and break up patches of country with high fuel loads. As with previous years, members of the Nyirripi Community are playing an important role in the fire management program.



The native Long-haired Rat was caught on Newhaven for the first time.

J.Schofield



Rangers from Nyirripi Community assist with the track survey.

D.Moore



Brush-tailed Mulgara.

A.James

Biological inventory and monitoring

As regular readers of *Wildlife Matters* will be aware, AWC field staff implement an extensive program of biological surveys across our properties. These surveys are designed to inventory the native species represented on our estate and to measure changes in ecological health over time, allowing us to report on the “ecological returns” delivered by your generous support!

Bowra

Bowra looks spectacular after a relatively long period of high rainfall. Following our preliminary survey trip in October 2010, the first systematic survey at Bowra took place in April this year. The survey team established permanent, standardised trapping sites in each of the four major ecosystems: mixed woodlands (of Cypress Pine, Ironwood, Poplar Box and Gidgee), short grass herblands, riparian areas, and Mulga woodlands.

The April survey recorded 148 different vertebrate species including 27 previously undetected species, bringing the total number of species confirmed on Bowra to 297 (20 mammals, 206 birds, 49 reptiles and 16 frogs). Eleven of these are listed as threatened by the Commonwealth and/or Queensland Governments. Bowra's flora was recorded via a set of vegetation surveys: 176 plant specimens now grace the field herbarium.

There were many highlights, including the first record of Giles' Planigale (or “Giles' flat-weasel”) a tiny, carnivorous marsupial of inland Australia, named after Ernest Giles, a desert explorer. The flatness of its tiny body helps the creature negotiate through the deep cracks of clay-based soils, an important habitat feature that protects the planigale from extremes of heat and cold, as well as predation from feral cats and foxes. Another first was the Central Short-tailed Mouse, significant because Bowra lies on the eastern edge of this animal's distribution. Five bat species were also added to the inventory, and new reptile records include the Strap-snouted Brown Snake and the Lined Earless Dragon. The only new bird species encountered was the Painted Button-quail, reflecting the thorough previous observational records of many birdwatching visitors to Bowra.

An integrated feral animal control program is a priority at Bowra: our ongoing sand-plot surveys have confirmed that foxes are relatively abundant and that feral cats, goats, pigs and rabbits are also present. Our objective is to reduce the measures of feral animal abundance to a level that is not ecologically significant.

Dakalanta

The inaugural survey at Dakalanta took place in March. Across much of the property the thin topsoil barely covers the limestone bedrock, posing a particular logistic challenge when sinking pitfall traps into the ground. The survey team started with crowbars and shovels, moved on to jackhammers, soon abandoning those for a fencing contractor equipped with a rock-drill...the effort was worth it with high capture rates of Western Pygmy Possums and Little Long-tailed Dunnarts. The team recorded almost 60 species of birds (including Australia's largest and smallest bird species, Emus and Weebills). The reptile fauna was rich, and included amazingly high numbers of Barking Geckos, a striking animal that, when alarmed, stands tall on all fours and impersonates a yapping dog. Some of the permanent trapping sites have been established in areas of Drooping She-oak habitat that were cleared historically, and which are now part of a revegetation program using locally collected seed. Ongoing surveys will paint a picture of how the community there is rebuilt.

Frogs, bats, quolls and more...

In addition to our comprehensive fauna surveys, we also carry out a number of surveys targeting individual species or groups of species. Some of these targeted surveys require the use of



AWC scientist inspects a Northern Quoll.



Northern Dwarf Tree Frog at Piccaninny Plains.

E. Mulder



Giles' Planigale.

E. Mulder

specialised equipment and techniques. Bats are a good example of this – we use harp traps and echolocation sound recorders to sample bats at night, focusing on areas that bats are most likely to fly through. We recently completed bat surveys at Bowra, Kalamurina and Scotia, with the latter survey returning 78 captures of nine species, including three that are listed as threatened. We were lucky to have the help of two of Australia's foremost bat ecologists, Dr Brad Law and Dr Roger Coles, for these surveys.

Frogs are another group requiring special attention – they emerge to breed in wet conditions, and yet this is when access for bipedal humans in four-wheeled vehicles can be tricky. The north-east ecologists braved sopping conditions at Piccaninny Plains in February, and sloshed through swamps, wetlands and creeks to record 17 species of frog, bringing the total number recorded on the sanctuary to 22.

A targeted approach is often useful for recording the presence of rare and threatened fauna that are not detected in general surveys because of their rarity. At Mt Gibson, we recently carried out a systematic survey for the Gidgee Skink (a nationally Endangered sub-species) by searching for its latrines amongst the log piles in which they make their home.

As well as recording simple presence, we also monitor the population trends of many threatened species with tailored surveys. All our reintroduced species at Scotia, Yookamurra, Karakamia, Paruna and Faure are monitored quarterly with a variety of traps, sand-plots and observational surveys, each modified to suit the species and context. A team of volunteers helped to collect the most recent round of population monitoring data for Yellow-footed Rock-wallabies at Buckaringa. This month, AWC interns and volunteers worked with staff to monitor Northern Quolls in the sandstone gorges of Mornington, using cage traps, camera traps and hair traps (sticky tape on a well-positioned stick that pulls a few body hairs off the animal as it passes by).

Targeted surveys aren't confined to iconic native species; we also monitor the introduced animals and plants that threaten Australia's wildlife, in order to measure whether our management programs are successfully reducing the level of these threats. For example, ecologists at Mornington recently completed a Kimberley region-wide survey for grader grass, an invasive grass that can have serious impacts on fire behaviour and woodland structure. The survey collated observations from property owners and managers, and combined these with aerial and ground surveys to complete the picture. This information is being used to develop a regional grader grass management plan.



A Little Pied Bat at Scotia.

M. Hayward



Western Pygmy-possum at Dakalanta.

P. Hammond



Painted Button-quail.

G. Jones

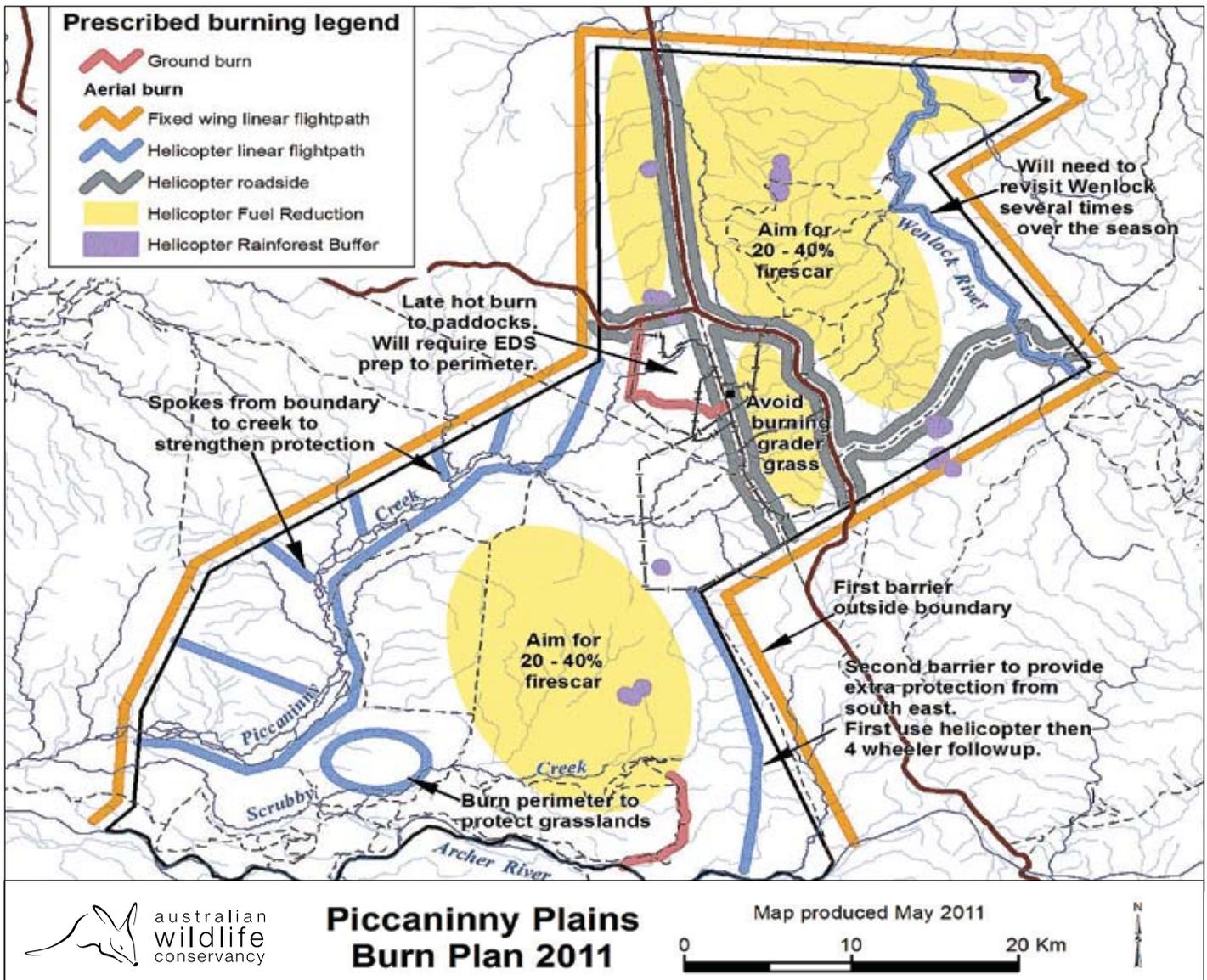
Fire update from north Australia

Across AWC's northern sanctuaries, fire management is a key focus during the first half of each year. Managers and scientists follow a rational process of evaluating the fire patterns of the previous year, before planning the coming year's prescribed burning program based on this assessment. For each sanctuary, ecological objectives (eg, the needs of small mammals or seed-eating birds like the Gouldian Finch) determine what the fire management program seeks to achieve by way of fire patterns. At the end of the fire season, AWC's ecology team then uses satellite imagery to measure whether our objectives have been met – ie, have we been able to deliver the fire patterns that meet our ecological objectives. These fire "metrics" then inform the process of planning and preparation for the following year.. and so the process of adaptive management continues.

Queensland

As an organisation, we are not big on meetings...but in May 2011, ten AWC land managers and ecologists gathered at Brooklyn for a comprehensive fire planning meeting for all the Queensland sanctuaries. This included a discussion of progress to date, plus drafting the sanctuary burn plans for 2011. The unusual weather patterns of 2010 have had a substantial impact on the prescribed

burning plans for 2011. The high rainfall resulted in copious grass growth (and therefore high fuel loads) across all the Queensland sanctuaries; this meant the prescribed burning needed to be carried out a little earlier than usual, before the grass had cured off properly, in order to ensure the intensity and extent of the fire was controlled. The burn programs at Piccaninny Plains and Brooklyn are well-advanced already.



At Mt Zero-Taravale, cyclone Yasi has shorn the limbs off many trees; this timber now lies on the ground, and raises the woody fuel loads dramatically. Careful burning, when the timber is still relatively moist, will be needed to reduce this fire hazard in a controlled manner.

Northern Territory

At Wongalara, above-average rain during the wet season ended abruptly in mid-April. This combination of events meant that grass in the open savannas cured and was ready to burn readily even though water was still oozing out of seeps and springs, and the soils were still damp. These are perfect burning conditions, as the fire intensity is low, fires burn very patchily, and vegetation recovers from fire quickly.

Chris Whatley (sanctuary manager) finished his prescribed burning program by June. As well as carrying out burns to achieve the ecological objectives of Wongalara's fire management strategy, Chris also paid special attention to reducing fuel along the eastern boundary. This is because the first section of the new exclusion fence for introduced herbivores will be built here and fence construction involves using equipment that is prone to producing sparks. Graders, rock drills, and other machinery are notorious sources for accidental ignitions in the northern savannas.

At Pungalina-Seven Emu, the prescribed burning program was complete by the end of May. The Garawa Rangers were active in the area to the west and south of Pungalina. In particular, they burnt along the edge of a public road that runs below the southern boundary; this prescribed burn will help protect Pungalina-Seven Emu from accidental roadside ignitions later in the year.

Kimberley

2011 marked the fifth year of EcoFire, the Kimberley regional fire management program delivered by AWC in collaboration with other landholders. With each successive year of the project, the prescribed burning in the early dry season becomes easier to implement, as the distribution of older vegetation improves across the 4.5 million hectare area. This was particularly the case in 2011, because the relatively 'wet' conditions of the previous dry season helped to reduce the incidence of extensive mid-to-late dry season fires during 2010.

Preparation for the eight week burning program began in February, when AWC staff attended a refresher course for the safe operation of the aerial incendiary equipment, with staff from the WA Department of Environment and Conservation. During March, the regional Burn Plan was developed, based on several planning iterations with landholders. The Burn Plan incorporates the specific objectives for fire management of each property, whilst coordinating their activities across shared boundaries.

The aerial incendiary program was carried out from April to mid June, backed up by burning from the ground to protect particular infrastructure, ecological or cultural assets. Overall, the team travelled over 30,000 km in the helicopter, and dropped over 45,000 incendiaries.



AWC staff Lindsay and James with an aerial incendiary machine.

S.Legge



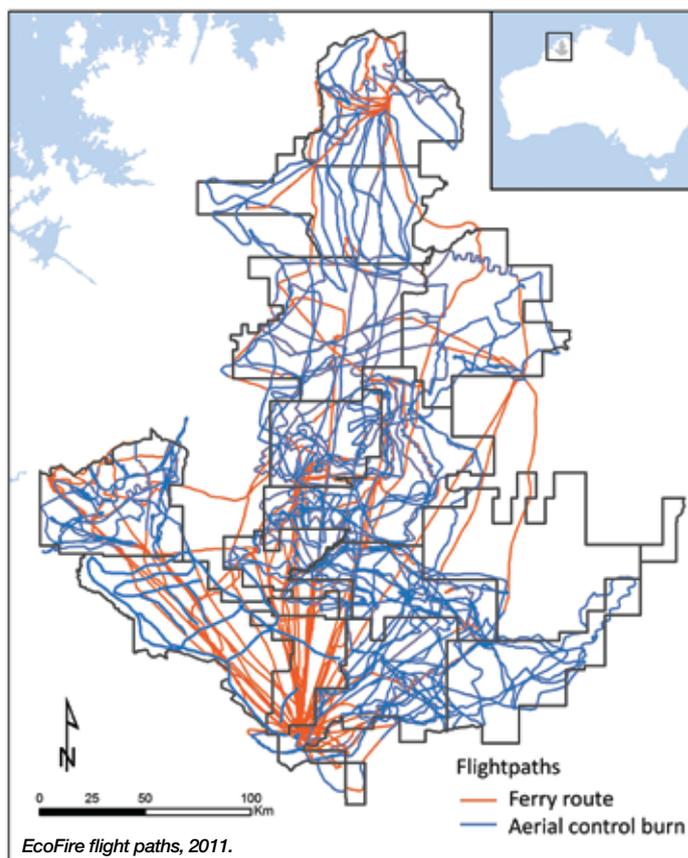
Low intensity prescribed burn.

S.Legge



AWC staff develop EcoFire burn plans with pastoral neighbours.

M.Roussel



EcoFire: saving wildlife and reducing greenhouse emissions

EcoFire is one of Australia's largest fire management programs. Implemented by AWC in partnership with other Kimberley landholders, EcoFire involves the delivery of prescribed burning across more than 4.5 million hectares of tropical savanna. In addition to promoting the conservation of the Kimberley's unique wildlife, EcoFire is also making a significant contribution to reducing Australia's greenhouse gas emissions. AWC is now working with our partners to quantify that contribution in a way that will allow "carbon credits" to be sold, generating revenue for participating landholders.

Fire in the tropical savannas

Fire is an inevitable, annual process in the savanna woodlands of northern Australia, where a predictable monsoon season stimulates prolific grass growth that dries and becomes highly flammable during the dry season. The area of savanna that burns each dry season is determined mainly by the previous year's rainfall, and varies regionally between 20 - 60%.

In other words, fires will occur each year in the tropical savannas and the proportion of each region that burns is fixed largely by reference to rainfall. Nevertheless, in recent decades, there has been a dramatic change in fire patterns in the savannas – in particular, the timing, scale and intensity of individual fires has been altered.

The loss of traditional aboriginal fire management (whereby small, low-intensity patchy fires create a network of wildlife refuges and landscape-wide firebreaks), combined with an increase in deliberate or careless ignitions, means contemporary fire patterns are now dominated by wildfires occurring in the mid-to-late dry season. At this time of year, heat, higher winds and lack of moisture promote extensive and relatively intense fires that

re-occur in any one place with high frequencies (eg, every one to two years). In summary, a higher proportion of fires are occurring late in the dry season and these fires are typically more intense and burn larger areas.

This change in fire patterns has contributed to the decline of a suite of native species, including seed-eating birds like Gouldian Finches, small mammals and fire-sensitive vegetation. **In addition, the shift in fire patterns has also increased Australia's emission of greenhouse gases.** In fact, savanna burning now contributes 2-4% of Australia's overall greenhouse gas emissions.

In the Kimberley, AWC co-ordinates the implementation of a massive fire management program called EcoFire. Implemented in collaboration with landholders across the central and northern Kimberley, EcoFire involves prescribed burning over more than 4.5 million hectares in order to shift the seasonality of fires back toward the early dry, thereby protecting native species and providing benefits to pastoralists (by preserving pasture) and indigenous communities (by helping to protect cultural sites). Just as we measure the success of EcoFire in protecting biodiversity,



Wungurr Rangers, working with AWC to plan an aerial incendiary route on Mt Barnett Station.



Fires in the late dry season (above) lack the internal patchiness of early dry season fires (right).

S.Legge

we are now seeking to quantify the extent to which EcoFire is also reducing the emission of greenhouse gases. It is possible that carbon “credits” generated by EcoFire can be sold, providing landholders with an innovative new funding source for fire management in the Kimberley.

How does active fire management reduce greenhouse emissions?

In tropical savanna ecosystems, carbon and nitrogen are recycled back into the atmosphere through one of two ways:

- by microbial decomposition (eg, in the soil, or the guts of termites); or
- by fire.

Both fire and microbes recycle carbon as carbon dioxide and methane. However, whereas the methane produced in a fire is released directly to the atmosphere, the methane produced by microbes or termites is removed by soil-living bacteria that specialise in metabolising methane for ‘food’ (ie, carbon and energy). Methane is a much more potent greenhouse gas than carbon dioxide, so the net effect is that for the same volume of vegetation, greenhouse gas emissions from burning vegetation are up to 30 times more than the emissions from microbial decomposition.

Fires that occur in the late dry season are more thorough than early dry season burns - within the same firescar footprint they consume substantially more vegetation. The photos (above) demonstrate these differences. Late season wildfires will therefore result in higher greenhouse gas emissions because they will consume more vegetation, with relatively less vegetation cycled through the microbial pathway. Accordingly, we can reduce greenhouse gas emissions by increasing the proportion of fires that occur in the early dry season: reducing the amount of vegetation that is burnt and increasing the amount subject to microbial decomposition.

The potential for reducing emissions is reset each year, regardless of what happened the previous year, because the tropical wet season results in another pulse of plant growth – material whose carbon can be recycled to the atmosphere either by fire or decomposition.

Measuring the reduction in emissions from EcoFire

In order to quantify the reduction in emissions from EcoFire in a manner that can generate valuable “carbon credits”, we need to demonstrate that our prescribed burning has reduced emissions relative to a baseline period prior to the commencement of EcoFire.

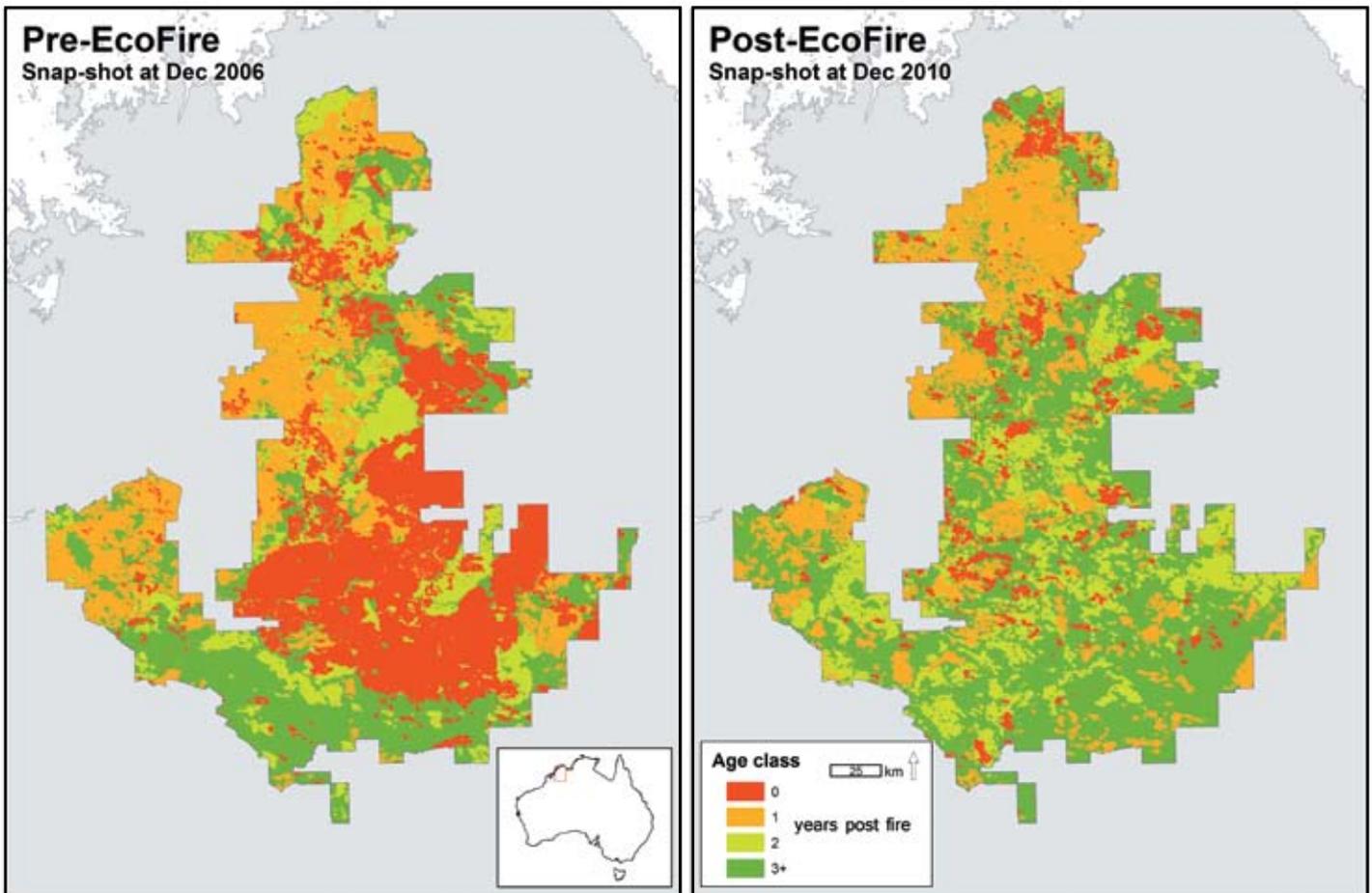
There are several key steps in this process including:

- We need to prepare a fire history map based on satellite imagery that describes the fire patterns in the absence of management.
- We need to produce a map defining the major vegetation types in the EcoFire area.
- For each vegetation type, data needs to be collected to establish the rate at which flammable material (grass, leaf litter, woody fuels) accumulates each year after a fire.
- Measurements also need to be made of the relative consumption of material by early and late dry season fires for each vegetation type as the fuel loads accumulate through time.
- Finally, we need to determine the mix of different gases produced by fire in different vegetation types and ages, and at different times of year.

Each year after we implement our prescribed burning, we will need to measure how the change in fire patterns caused by our activity has reduced the amount of vegetation that has burnt. In turn, we can estimate the emissions that have been avoided as a result of our fire management. These “credits” should have a value that can be realised, either under government programs such as the Carbon Farming Initiative or in the voluntary marketplace (or perhaps ultimately in a formal emissions trading regime).

One precedent for this approach exists: the West Arnhem Land Fire Abatement (WALFA) Project, which has used prescribed burning to shift the seasonality of fires to the early dry season, thus reducing the amount of material burnt each year, with resultant emissions reductions of more than 100,000 tonnes CO₂-e each year since 2007.

From AWC’s perspective, it is also critical to demonstrate that EcoFire will continue to have a positive effect on biodiversity. It is possible a fire strategy that will maximise greenhouse benefits (and the value of carbon credits) will not maximise biodiversity benefits. For example, will a burning regime that minimises the emission of greenhouse gases represent an optimal strategy for the survival of the Gouldian Finch and the Northern Quoll? AWC’s primary objective is the conservation of biodiversity: we need to carefully consider the relationship between biodiversity and carbon objectives in developing our fire strategies in the Kimberley and elsewhere.



This pair of maps shows the spatial arrangement of different-aged vegetation in the EcoFire project area at the end of 2006 (ie, pre-EcoFire) and then at the end of 2010. The area burnt each year has decreased, and patches of older vegetation (ie, three years or more since the last fire) have increased in number and are spread more evenly through the project area.

Work in progress...

EcoFire delivers prescribed burning annually across 4.5 million hectares of conservation, pastoral and indigenous-held land. The project has clearly demonstrated a shift from late to early dry season burning, with associated benefits to ecological indicators (such as vulnerable species like Purple-crowned Fairy-wrens, Gouldian Finches, and small mammals). To date, the project has been funded by grants from the Federal Government, and more recently by the Western Australian Government. Demonstrating the greenhouse benefits of EcoFire, and establishing marketable carbon credits, has the potential to generate a market-based revenue stream for landholders, funding ongoing fire management and supporting employment for local indigenous communities and pastoralists.

To this end, AWC has begun working with partners, including CSIRO scientists who developed the original concept of emissions abatement through savannah burning, and the Western Australian Government, to quantify the greenhouse gas abatement achieved by EcoFire. Field data is being collected, the necessary satellite-based fire history collated and vegetation maps produced.

Since the project operates over pastoral land, we also have the opportunity to examine how fire management and grazing by cattle interact to affect emissions. For example, if the prescribed burning results in increased cattle numbers (by reducing the loss of pasture to fire), we may need to discount the gains from fire management with the increase in emissions from additional cattle! On the other hand, if the fire management improves grass quality, cattle will produce less methane (methane production is related to the digestibility of the grass), and may even be turned off the land sooner because of higher growth rates...both of which would decrease greenhouse gas emissions.

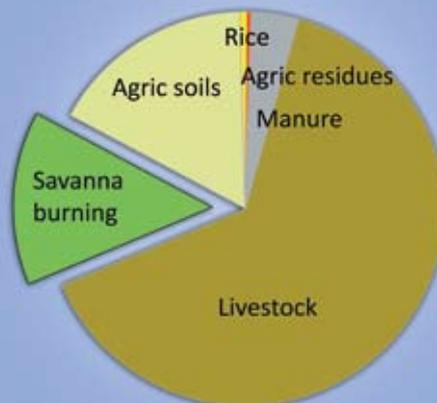
While there are complex issues still to be addressed, quantifying the greenhouse benefits from EcoFire is a priority for AWC because it has the potential to generate an innovative funding stream for

landholders and communities in the Kimberley. As demonstrated by the success of WALFA, the model is also applicable in other regions across the tropical savannas including the Gulf (Pungalina) and Cape York (Piccaninny Plains).

Greenhouse emissions from agriculture

The agricultural sector makes up 15% of Australia's annual emissions; this sector is the biggest source of methane and nitrous oxide (60% and 75% of these gases respectively).

Agricultural emissions arise mainly from 'enteric fermentation' of livestock (ie. gases produced in the rumen during digestion, 65%), gas release from soils used for cropping as a result of fertiliser application and using nitrogen fixing plant species (14%), and savanna burning (12%); see piechart; 2009 data from the Australian Government (below).



Australia's agricultural emissions.



The water first entering a dry Lake Eyre via the Warburton Groove.

W.Lawler

Kalamurina

Kalamurina Wildlife Sanctuary is Australia's largest non-government highly protected area, covering over 670,000 hectares (1.7 million acres). It is home to a number of threatened species including the Crest-tailed Mulgara and Dusky Hopping Mouse. For the last three years, Kalamurina has also been the site of one of Australia's greatest natural spectacles...the filling of Lake Eyre!

Kalamurina protects the northern shore of Lake Eyre, as well as the last 100 kilometres of the Warburton River (see map). Rains in south-west Queensland in 2009 initially resulted in floodwaters flowing down the Warburton River and into Lake Eyre. The amazing photograph at the top of this page captures the water first entering a dry Lake Eyre via the Warburton Groove. After further substantial rains this year in Queensland and South Australia, the Warburton is again flooding and the Lake is set to reach its highest levels since 1974.

Kalamurina was acquired with assistance from the Australian Government and the generous support of AWC donors, especially The Nature Conservancy and the Thomas Foundation. The acquisition was a critical step in increasing protection for



Lake Eyre by securing the lower reaches of the Warburton and other key tributaries. With the floodplains of the Warburton destocked for the first time in decades, the recent rains will truly usher in a new era for the wildlife of Kalamurina and Lake Eyre.

North Head: Bandicoots and Bush Rats

At North Head Wildlife Sanctuary, in Sydney, Nelika Hughes and Cam (our scientific intern) have been busy trapping, radio tracking and eradicating pests! Radio-tracking of Long-nosed Bandicoots indicates they are happily foraging in recently regenerated areas of endangered Eastern Suburbs Banksia Scrub (ESBS), though the bandicoots are still nesting in more established vegetation. The fact the bandicoots are foraging in new vegetation reinforces the value of the current collaboration between AWC, the Sydney Harbour Federation Trust and the North Head Sanctuary Foundation to regenerate areas of ESBS. Our efforts to regenerate these areas which will be invigorated by future controlled burns (if it ever stops raining...).

The '*Bandicoots on the Brink*' cat survey project at North Head has recently wrapped up. No cats have been found on the headland, which is a good sign for the up-coming Bush Rat reintroduction. Nelika and Cam will spend much of July trapping and removing feral black rats from reintroduction sites on North Head in readiness for the planned release of Bush Rats in early August. The Bush Rat, also known as the Bogul, is a native rodent that was once common in Sydney. However, it has disappeared from many areas, including North Head and other areas adjacent to Sydney Harbour. Bush Rats will be reintroduced to North Head and several other harbour sites as part of a project led by Sydney University. The purpose of the reintroduction is to help restore the native fauna of Sydney Harbour; and to determine if the native Bush Rat (the hero) can outcompete the feral Black Rat (the villain).

Yookamurra: Bilbies, Boodies and Woylies

Yookamurra Wildlife Sanctuary occupies more than 5,000 hectares in the Murray Mallee in South Australia. Around 1,100 hectares is enclosed by a feral-proof fence. The fence was upgraded by AWC after we purchased Yookamurra, enabling Bilbies and Boodies to be released into the fenced area in 2008. Woylies and Numbats had previously been released in the fenced area.

Recent monitoring by AWC field ecologists and land managers, as part of our program of measuring the Ecological Health of our sanctuaries, has demonstrated significant increases in the Bilby and Boodie populations, with Woylies and Numbats likely to have reached carrying capacity. No single monitoring method works for all species, so we use a range of methods to derive population estimates. At Yookamurra, we use mark-recapture trapping for the Boodies and Woylies, distance sampling spotlighting transects for the Boodies and Bilbies, and daylight transects for the Numbats.

The Bilby population in the fenced area has grown from 22 to more than 100 individuals in only three years – reflecting their ability to respond quickly to a glut of resources (as Yookamurra would have been because no species was utilising the underground invertebrates and plant material). Boodies remained relatively constant at less than 50 individuals for the first two years post-release; however the flooding rains of late 2010-early 2011 have seen a massive breeding event with the population increasing substantially to an estimate of more than 200.

Yookamurra is famous for more than just Boodies and Bilbies... it protects a valuable population of Southern Hairy-nosed Wombats as well as hosting a dedicated program of school visits throughout the year. A highlight of our public education program was a recent visit by students from the remote area school at Kalumburu, in the north Kimberley.



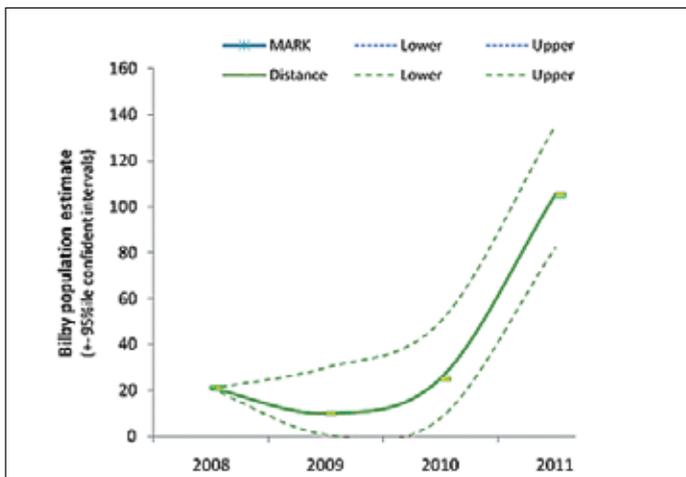
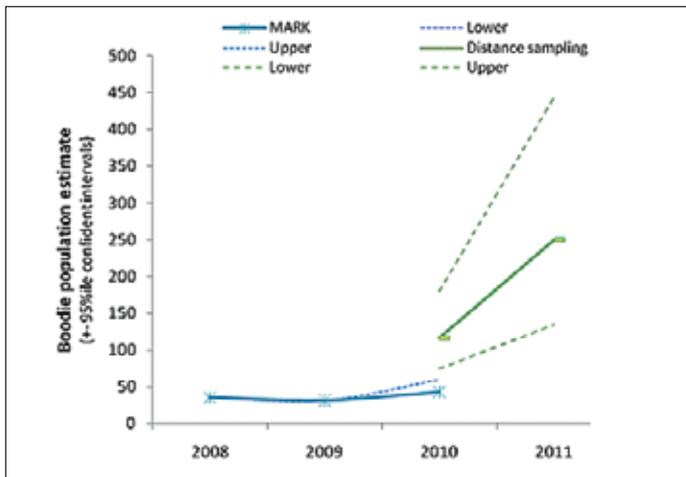
Tamar Wallaby.

W. Lawler

Karakamia, Paruna and Faure Island

In an ongoing translocation program, 60 Brush-tailed Possums and 35 Tamar Wallabies were moved from Karakamia to Paruna. Their fate is being closely monitored by staff and an Honours student; the survival of each individual will be related back to characteristics of their behaviour before release (eg, their boldness, assertiveness, etc), in order to see whether we can use these attributes to select animals for translocation that are most likely to survive. The most recent release to Faure Island in Shark Bay was of three more Banded Hare wallabies (one with an advanced pouch young), bringing the total number released there to 62. The Faure Banded Hare-wallaby population continue to thrive.

The Granite Worm Lizard and Western Three-lined Skink were found for first time on Karakamia in December fauna surveys, and the Masked Owl was seen for the first time during nocturnal spotlighting. The March surveys on Faure Island revealed a snake species that was 'new' to the island's inventory – the very attractive Jan's Banded Snake. These finds illustrate the value of continuing to carry out inventory surveys long after you might think you've identified every species on a property!



A Burrowing Bettong, or Boodie.

B. Yabsley



Yellow-billed Kingfisher, a Cape York endemic.

Brooklyn, Piccaninny Plains

The new managers at Brooklyn and Piccaninny Plains have been quickly gaining familiarity with their sanctuaries, and have attacked the long list of tasks that mark the beginning of the dry season with enthusiasm, guiding visitors, carrying out the prescribed burning programs, mustering, repairing fences and flood gates, restoring infrastructure, grading roads and strategically controlling weeds in that critical period between new growth during the wet and seeding soon after. A new cooperative agreement with our western neighbours at Brooklyn has facilitated a clean-up muster of the western part of the sanctuary – an area where migrating cattle have been a recurrent problem.

Mornington, Artesian Range

The wet season from December to April was prodigious, causing substantial damage to internal roads on Mornington, and cutting access to the Artesian Range for most of the first half of the year. Nevertheless, the new amenities building for the Mornington Wilderness Camp staff is finished. Dr Don Franklin, a well-known north Australian ecologist, joined the science team at Mornington for two months on secondment from Charles Darwin University, to be part of the ongoing research program on seed-eating birds (like Gouldian Finches).

The focus of activity on the Artesian Range, at Charnley River, has been fire management. A careful burn plan was executed to produce a network of early dry season firescars which will stop the spread of fires later in the year. The Kimberley ecologists were helicoptered in to spend five days in the rugged sandstone ranges, familiarising themselves with the geography, flora and fauna. They set just six camera traps for those five nights, yet collected almost 3000 photographs of Northern Quoll, Wyulda, Monjon, Short-eared Rock-wallaby, Northern Brown Bandicoot, Kimberley Rock-rat, Black Grasswren...and the odd interloper like Dingoes and Euros. The Northwest Interns (Bryony and Rosie) valiantly sifted through all the photographs, and sketched the spot patterns of each Northern Quoll captured by the cameras. The spot patterns are highly variable between quolls, allowing individual identification. They identified that at least 16 different Quolls had visited the six cameras. Northern Quolls are one of the native mammal species that has collapsed across much of northern Australia, and the density recorded at Charnley is now a thing of the past in most of its range.

Camera trap images from the Artesian Range.



Wyulda.



Monjon.



Northern Quoll.



An unidentified rock-wallaby species.

The Bilby Challenge: matching your donations to AWC.

Please match my gift under the Bilby Challenge. Eligible gifts attract a 50% match.



Yellow-footed Rock Wallaby at Buckaringa Wildlife Sanctuary.

W.Lawler

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- 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.
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- 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.
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