ARID RECOVERY

2012-2013
Annual Report

2012-13 ANNUAL REPORT

For more information on Arid Recovery visit www.aridrecovery.org.au or call 08 8671 2402.

This document is the 15th in a series of annual reports and outlines the activities of Arid Recovery for the period from 1st July 2012 to 30th June 2013.

Arid Recovery is an independent, not-for-profit conservation initiative that has been restoring Australia's arid lands since 1997. Our success is attributed to many supporters including the unwaivering support of the local community through volunteers and the long term support from our major sponsors BHP Billiton, SA Department for Environment, Water and Natural Resources and the University of Adelaide.

Copies of this report, supplementary information and previous reports are available on the Arid Recovery website.

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Cover photo: The Arid Recovery eagle at sunset Photo by: Anni Walsh

Contents

Arid Recovery Board

Garry Winter
Chair of Arid Recovery Board
Independent
Partner at Kelly & Co Lawyers in South Australia.

Kym Winter-Dewhirst
Representative for BHP Billiton
Vice President of External Affairs for BHP Billiton's Uranium Customer Service Group.

Associate Professor David Paton AM
Representative for the University of Adelaide
School of Earth & Environmental Sciences

Professor Sue Carthew
Independent
Pro Vice Chancellor for the Faculty of Engineering, Health, Science & the Environment at Charles Darwin University

Mark Priadko
Independent
Financial management, financial & business analysis and business case consultant.

John Schutz
Observer on behalf of the SA Department of Environment, Water and Natural Resources
Executive Director of Regional Services for DEWNR.

New members of the AR Board

IN 2013 Arid Recovery partners, BHP Billiton, the University of Adelaide and the SA Department of Environment, Water and Natural Resources, appointed new representatives to the Arid Recovery Board.

Darryl Cuzzubbo
Representative for BHP Billiton

I am delighted to be on the AR Board. What Arid Recovery is doing is remarkable and is really making a difference - something that they should be very proud of. As part of the Board, I am keen to see how we can further support, build upon and communicate the great work that Arid Recovery are doing.

Darryl is the Asset President for BHP Billiton's Olympic Dam Asset in South Australia

Bob Hill
Representative for the University of Adelaide

Arid Recovery fits very well within the aspirations of the Faculty of Sciences at the University of Adelaide. The long term commitment to the arid environment with a strong underpinning of high quality science made this a natural fit for me and I am pleased to be involved.

Bob is Executive Dean of the Faculty of Sciences at the University of Adelaide

Allan Holmes
Representative for the SA Department of Environment, Water and Natural Resources

I have joined the Board to see whether I can help AR through its next stage of evolution. I am also looking forward to working with a re-energised Board and testing what is possible to achieve in such an important area of biodiversity conservation.

Allan is CEO of the SA Department of Environment, Water and Natural Resources

OUR PEOPLE

CEO Report

KYLIE PIPER

THE PAST 12 months have seen some major changes in the Arid Recovery team, with some long term Board members moving on. They have been instrumental in the development of AR as an independent organisation and we look forward to their continued support in the future. With these changes came the opportunity to look at the development of our long-term partnerships and future strategies to assist us in achieving our conservation and research goals over the coming years.

The year was filled with planning for these new opportunities, and as has been the case for so many organisations locally and globally this year, redefining of plans and looking for new ways to work within a changing global landscape. The town of Roxby, although a little quieter, has continued its great support for the work of Arid Recovery. I'd like to personally thank the volunteers, members and businesses of Roxby Downs and Olympic Dam who have, through their own difficult times continued to assist us.

It is during years like this that we realise why the partnership of industry and community that created Arid Recovery works so well. Although we are sometimes defined by our industry partners that we work so closely with it is the community that binds us together at our core and without its support and encouragement we cannot continue to be the success that we are.

Ecologist Report

CATHERINE LYNCH

LOOKING BACK at my first year at Arid Recovery I feel a real sense of pride in what Arid Recovery is all about and feel very privileged to have the opportunity to work with such a passionate and dedicated team of staff and volunteers. The year for me has been one of consolidation, as I have carried on Arid Recovery's long term monitoring programs as well as looked at ways in which we can further enhance our research and monitoring outcomes with respect to the Reserve's restoration process. In the year to come I look forward to developing management plans for the 'AR Big Four' as well as furthering Arid Recovery's monitoring and research programs so that we can ensure the long-term sustainability of our Reserve and inform conservation efforts elsewhere.

Every day at Arid Recovery is different, and nothing beats being able to work amongst all the amazing plants and animals that grace the red sand dunes of the Reserve. I am looking forward to the next year with a sense of excitement and anticipation for continuing to be a part of such a renowned conservation and research organisation, and working with our wonderful team of staff, volunteers and the Roxby Downs community.

OUR PEOPLE

Arid Recovery staff

Thanks to all Arid Recovery staff and special contractors who assisted in the development and administration of the organisation over the past year.

General Manager/CEO
Kylie Piper

Staff
Bianca Amato
Tyson Brown
Helen Crisp
Bianca Dodd
Marty Kittel
Cat Lynch
Katherine Moseby
Katy Read
Tina Schroeder
Sam Secker
Hannah Spronk
Hayley Thompson
Anni Walsh
Craig Wyatt

Scientific Advisory Group

Peter Copley
Katherine Moseby
David Paton AM
Reece Pedler
John Read

⬅ Katy Read (left) and Bianca Amato (right), Arid Recovery interns for 2012-13.
Photo by: Kylie Piper

10 years on the fenceline

For 10 years Marty Kittle has been protecting the Arid Recovery fenceline. Every 9 days or so, since 2003 Marty Kittle has driven around the boundary fence of the Arid Recovery Reserve. He is the longest serving staff member at Arid Recovery and has been a valuable source of information and assistance for all new staff members starting their time at AR.

⬇ Marty Kittle *Photo by: Lawrence Creative*

ⓘ For more information on the people of Arid Recovery visit www.aridrecovery.org.au or call 08 8671 2402.

Thankyou to the volunteers of Arid Recovery:

Special thanks to the following people who have volunteered their time over the past twelve months:

Matthew Atken
Bianca Amato
Janet Bennett
Peter Bennett
Tanya Bertossi
Dennis Campbell
Kate Carrol
Rowan Carroll
Perri Carter
Carvalho Family
Fernando Carvalho
Tom Clarke
Ben Cronin
Natasha Crook
Rogie Dally
Alice Dunbar
Scott Elliott
Aaron Fenner
Tim Finn
Tyson Flemming
Jenna Forbes
Bree Galbraith
Stephanie Godfrey
Blake Gontar
Jake Gotch
Travis Gotch
Waylon Gowans
Eugene Gray
Travis Hague
Col Heckenberg
Darren Herring
Beau Hunt
Paul Huston
Ellen Ingold
Jeff Ingold
Nicholas Ingornor
Cody Innes
Zoe Jellie
Graham Jenkins
Alex Jennings
Shane Jenning
Ben Jewell
Stewart Jones
Nathan Kay
Richard Kelly
Mark Killick
Kovac Family
Ken Lamb
Timothy Leggatt
Megan Lewis
Oliver Lintott
Trevor Lovegrove
Mark Manning
Brett McDonnell
Chris McGoldrick
Travis McKay
Jennifer McKenzie
Jamie Millard
Dave Miller
Kristian Molnar
Kane Mooney
Kevin Mooney
Yvette Mooney
Barbara Murphy
Bridget O'Connell
Paisley Family
Peter Paisley
Ben Parkhurst
Reece Pedler
Brett Penn
Andrew Petty
Johan Poteiter
Tim Quinn
Katy Read
Blake Rhyan
Conner Rhyan
Jacqui Rhyan
Jason Rhyan
Brad Rynne
Luke Sanders
Marie Schildt
Leigh Scott
Alan Sherlock
Jacqueline Sproule
Phillip Strugnell
Brenton Taylor
Lisa Taylor
Jess Thompson
Phil True
Joshua Wall
Shane Watson
Matthew Whitrod
Anthony Wyatt
Margaret Wyatt

15 years of the Arid

1997

1998

The first threatened species is re-introduced into the Reserve with the release of 12 Greater Stick-nest Rats.

1999

10 Burrowing Bettongs re-introduced into the Reserve.

2000

Nine Greater Bilbies are released inside the Reserve.

2001

The Western Barred Bandicoots is released into the Reserve for the first time.

2004

First external release of Greater Bilbies, with four surviving for more than 100 days after release.

Feral free area

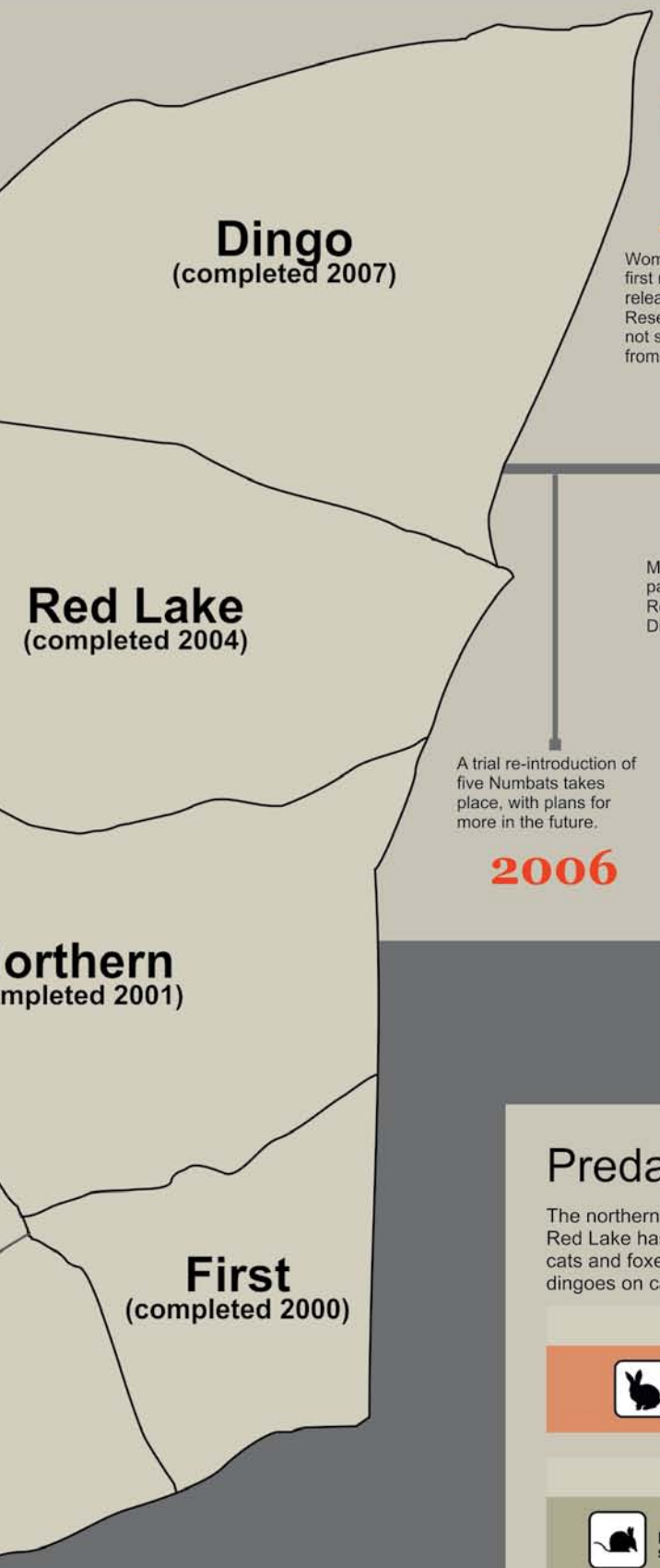
60 square kilometres of the Arid Recovery Reserve is free of rabbits, cats and foxes.

Dingo	37km²
Northern	30km²
Red Lake	26km²
Main	14km²
2nd	8km²
1st	8km²

Re-introduced species

Feral species

Recovery Reserve



2009

Arid Recovery becomes an independent, charitable organisation.

2007

Woma pythons are the first reptiles to be released inside the Reserve, unfortunately not surviving predation from the Mulga snakes.

2012

Male and female dingo pair released within the Reserve as part of the Dingo Project.

2008

2011

Extensive rainfall in 2010 and 2011 sees a boom in populations of small mammals.

A trial re-introduction of five Numbats takes place, with plans for more in the future.

2006

Predator treatment

The northern half of the Reserve is home to ferals, friends and foe! Rabbit eradication in Red Lake has been ongoing since 2007 and is being assisted by the presence of a few cats and foxes. Whilst in the Dingo pen, research continues to gauge the impact of dingoes on cat and fox numbers.

Dingo

Rabbits	Cats and/or foxes	Dingoes

Red Lake

Re-introduced species	Rabbits	Cats and/or foxes

SPECIES REPORT

Re-introduced species

POPULATIONS OF all four of Arid Recovery's re-introduced species continued to increase over the last year, particularly our Burrowing Bettongs (*Bettongia lesueur*). Interestingly, track counts for bettongs dropped slightly in the Main Exclosure over the 12-month period, but increased considerably in the First and Northern Expansions, leading to a general increase in the bettong population across the Reserve. Development of management actions for bettong overpopulation consequently became a priority for the year, with impacts to Reserve vegetation and other species becoming evident, particularly in the drier conditions experienced in 2012-13, compared to the two previous years.

Western Barred Bandicoots (*Perameles bougainville*), Greater Bilbies (*Macrotis lagotis*) and Greater Stick-nest Rats (*Leporillus conditor*) showed a steady increase over the 12 months, with bandicoots in particular continuing to do very well.

The population of Western Barred Bandicoots within the Main Exclosure remained relatively steady despite natural population fluctuations, but increased substantially within the First Expansion. The population of Greater Bilbies remained relatively steady overall across the whole reserve, however a decrease in the population was observed in the Main Exclosure and First Expansion which was offset by an increase in the Northern Expansion. Population declines in the Main and First is likely to be the result of drier conditions and impacts of bettong overgrazing. The population of Stick-nest Rats within the Reserve remained steady overall, with a decline in track counts observed within the Main Exclosure. This is likely to be partly due to bettong overpopulation; causing damage to nests and a reduction in food supply.

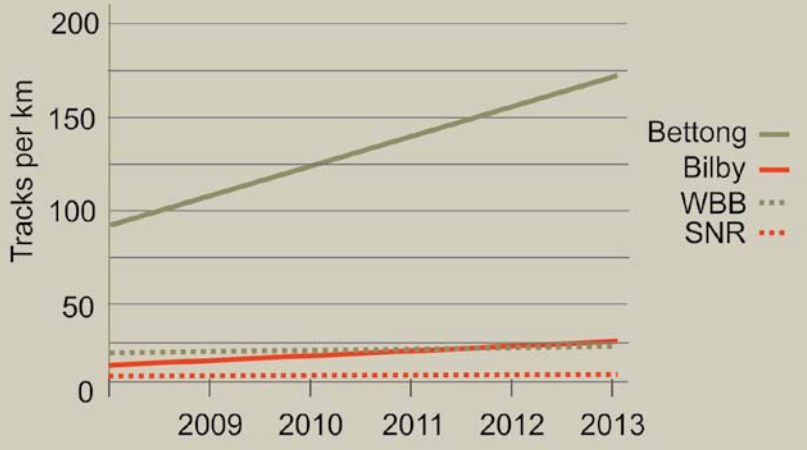
The Second Expansion continues to be problematic in terms of maintaining it as a control area, with all four reintroduced species now present. With increased numbers of bettongs throughout the rest of the Reserve, the Second Expansion has provided somewhat of a haven for the other three re-introduced species, with track counts of bandicoots and bilbies increasing noticeably in this expansion over the past 12 months.

⬅ (far left) Greater Bilby (*Macrotis lagotis*) *Photo by: Ben Parkhurst*
⬅ A baby Greater Stick-nest Rat (*Leporillus conditor*) *Photo by: Catherine Lynch*

ⓘ For more information on the people of Arid Recovery visit www.aridrecovery.org.au or call 08 8671 2402.

SPECIES POPULATIONS

Average track counts per km for feral-free areas inside the Arid Recovery Reserve



⬅ Estimates of average track counts in the Main Exclosure, First Expansion & Northern Expansion) are shown for all four re-introduced species over the past 5 years.

Populations of bettongs have increased to the point where they may be masking populations of the other species.

SPECIES REPORT

Bettong management

BURROWING BETTONG numbers have been increasing dramatically since their reintroduction to the Arid Recovery Reserve in 2001 and now have an estimated population size of several thousand individuals.

In the Main Exclosure, track counts reached their highest on record in August 2012 with 385 tracks recorded per kilometre of walking transect. Overpopulation of Burrowing Bettongs within the Arid Recovery Reserve has been an issue that has gradually increased in significance over the last few years. High numbers of bettongs are having numerous impacts on the Reserve, including:

- Increasing competition within the bettong population as bettongs are continuing to breed despite limited resources
- Extensive damage to vegetation, particularly perennial seedlings
- Decreased habitat quality for Greater Stick-nest Rat nests due to increased grazing pressure from bettongs

VEGETATION DAMAGE

A number of species of plants are used to monitor vegetation condition inside the Reserve. Four key plant species have been used to monitor damage due to over-grazing by bettongs.

⬇ Damage to *Dodonaea viscosa* in the Main Exclosure.

⬅ The number of bettongs inside the Reserve has continued to increase over years of good rainfall.
Photo by: Kylie Piper

⬇ Bettongs at a one-way gate inside the Reserve.
Photo by: Arid Recovery

Vegetation monitoring during 2007-08 found the beginnings of browsing impacts from bettongs. More recent monitoring has found damage including bark stripping, digging at the roots of plants, defoliation and sometimes plant death of Mulgas and other Acacias, Sennas, Bullock Bush and other perennial species.

The Arid Recovery Scientific Advisory Committee and staff have discussed management options for dealing with the overpopulation of bettongs ranging from minimal intervention (i.e. do nothing) to significant management (e.g. move animals to outside the Reserve or to other reserves, or culling). A number of factors must be considered when determining the most appropriate action(s), including the welfare of other fauna species and the bettongs themselves. Other factors include the protection and continued restoration of vegetation within the Reserve to achieve Arid Recovery's stated vision of restoration of Australia's arid lands, compliance with animal welfare legislation and the current and future management and research undertaken at the Reserve.

Short-term management actions were proposed and adopted in May 2012, with the decision made to relocate a large number of bettongs (up to 3000 if necessary) outside of the Arid Recovery Reserve to create a possible wild population. This would significantly decrease the overall bettong population inside the Reserve and also avoid further impacts to the existing bettong population, and prevent irreversible damage to vegetation and impacts to other fauna within the Reserve. The results of the short-term action plan will feed into a long-term management strategy to be prepared by the end of 2013.

ⓘ Further information regarding the re-introduced species at Arid Recovery visit the Arid Recovery website at www.aridrecovery.org.au.

RESEARCH REPORT

Research report

MONITORING WORKSHOP

IN NOVEMBER 2012 a meeting of the Arid Recovery Scientific Advisory Committee was held to discuss the long-term monitoring programs undertaken by Arid Recovery. The meeting included discussions on the current results of the annual trapping program for small mammals and reptiles, which has been ongoing for over 15 years. AR Research Scientist, Katherine Moseby presented results from the current trapping program and, in conjunction with AR's Ecologist Cat Lynch, proposed new models for future trapping events, that included amendments to trap types and locations (see summary table below).

The meeting also discussed recently completed analyses, undertaken by Brydie Hill on the long-term vegetation monitoring at Arid Recovery. Funded by a research grant from the Native Vegetation Council, Brydie undertook a review of results to date. The findings of the research were inconclusive and a revision of the way the vegetation at AR is monitored is currently being undertaken by the Catherine Lynch, the AR Ecologist.

➡ One of the dingoes radio-collared for the dingo project

⬇ A vegetation monitoring photopoint within the AR Reserve *Photo by: Catherine Lynch*

DINGO PROJECT

THE ARID RECOVERY Dingo Project entered its final phase in 2012 – the removal of dingoes from the Dingo Pen. The project has looked at the interaction of dingoes, cats and foxes, over a 3 year span. In 2012 funding was received through the University of NSW to continue the project for 12 months and investigating behavioural patterns of dingoes and small mammals. The project will be completed in 2013, with a research paper scheduled for publication in 2014 discussing the results of the project.

ARC LINKAGE GRANT

ARID RECOVERY and the University of NSW were successful in their application for an ARC linkage grant in mid-2013. The new project aims to investigate prey naivety and determine if in situ predator training, pre-release screening and selective breeding can improve predator awareness behaviour. The results of the 3 year research project, to commence in November 2013, will inform future Arid Recovery management and, it is hoped, increase the success of any future re-introductions.

ⓘ Further information regarding the Arid Recovery research projects are available on the Arid Recovery website at www.aridrecovery.org.au.

SUMMARY OF CHANGES TO MONITORING TO BE TRIALLED OVER COMING YEARS

The following recommendations were the result of the Arid Recovery Monitoring workshop in November 2012.

ANNUAL TRAPPING PROGRAM

Key recommendations

- Trapping on both dunes and swales each year
- 4-5 nights of trapping over a 2 week period with staggered trapping of sites
- Adjust pitfall traplines by adding 6 large diameter pits to the current 6 small diameter pits
- Cease to use Elliott traps – but trial to see if removal has significant impact on results
- Aim to co-ordinate trapping with BHP Billiton to generate larger dataset

⬅ A volunteer sets a pit-fall trap line during 2013 Annual Trapping. *Photo by: Hannah Spronk*

VEGETATION MONITORING

Key recommendations

- Compile list of key species to be monitored on an ongoing basis
- Analyse existing data more thoroughly to assess if capable of detecting fine scale changes
- Increase sampling effort and sensitivity at each site to reduce variability
- Establish additional "Jessup" transects to better sample vegetation responses
- Incorporate counts of plants (as opposed to just cover) in monitoring programs
- Continue to monitor seedling damage of the four key species currently being monitored
- Develop a monitoring program (integrated with the above program) to measure recovery of vegetation post-bettong removal

RESEARCH REPORT

Conferences

A NUMBER OF conferences were attended by Arid Recovery staff throughout the year. These have assisted in developing new techniques to be used in the ongoing management of the Reserve.

ACEAS WORKING GROUP: ADVANCING THE APPLICATION OF ANIMAL TELEMETRY IN ECOSYSTEM MANAGEMENT

THE AUSTRALIAN Centre for Ecological Analysis and Synthesis (ACEAS) is a facility within the Terrestrial Ecosystem Research Network (TERN) for integration, synthesis and modelling of ecosystem data to aid in the development of evidence-based environmental management strategies and policy at regional, state and continental scales. The Animal Telemetry ACEAS working group was set up with the aim of advancing the application of animal telemetry data in ecosystem management.

The working group has held two workshops, one of which was attended by AR Ecologist, Cat Lynch, in April 2013. The focus of this workshop was to analyse and synthesise animal telemetry data provided by Arid Recovery, with the aim of demonstrating how this data can be used to inform ecosystem management. The group looked at data collected from introduced predators (cats and foxes) and re-introduced native species (bettongs). It was hoped that analyses of this data would provide Arid Recovery with information on how to most efficiently undertake feral predator control to allow for successful re-introductions of native species in the future.

Using data from previous re-introductions, feral control programs and radio-tracking data, the group compiled datasets for each species and relevant environmental layers to model spatial distribution, habitat association, range overlap and dispersal potential of species. The findings from the ACEAS group will be used to guide adaptive management for Arid Recovery over the coming year. GIS and telemetry data from future Arid Recovery feral control and re-introduction programs will be used to ground-truth the work of the ACEAS group and assist in its ongoing development.

ACEAS AIMS

Advancement in animal-borne technologies and remote sensing is enabling researchers to collect information about animal interaction with the environment at ever improving levels of resolution and accuracy. Understanding movement of individuals can aid resource managers and policy makers to improve the management of animal populations.

⬅ A dingo caught on a remote camera.
Photo by: Arid Recovery

⬆ A Western Barred Bandicoot in the Reserve
Photo by: Arid Recovery

CAMERA COLLOQUIM

IN SEPTEMBER 2012, Arid Recovery's Scientific Field Officer Anni Walsh attended the Camera Trapping Colloquium in Wildlife Management and Research at Taronga Zoo, Sydney. This was the first conference specifically devoted to the use of camera trapping in wildlife research/management. The colloquium was attended by over 200 people with a range of professions and people from diverse backgrounds. There were research students, government organisations and NGO's in the mix and people that use remote cameras on a daily basis mingled with people who were relatively new to this intriguing technology.

The conference was hosted over two days and a range of organisations and people gave oral presentations or displayed posters. The conference covered various areas of interest including technology constraints and pitfalls, survey design, standards and protocols, data and image management and identification and analysis. Each interest area included presentations by current practitioners identifying their research projects and discussing their findings.

As camera trapping is a relatively new method of monitoring wildlife, there was much discussion on the limitations of camera trapping as a scientific tool. The model and specifications of the camera, method of setup, location, weather and target species were outlined as limiting factors using remote cameras as a monitoring method. With research on these limitations it is hoped that there will be an opportunity to bridge the gap between camera design and researcher needs.

Camera trapping is a useful method of monitoring animals in their natural environment enabling data to be collected, monitoring animals within their natural environment. For Arid Recovery, the use of camera traps provides staff with a "round-the-clock" solution to the collection of data on the nocturnal re-introduced species at the Reserve.

ⓘ Further information regarding the Arid Recovery research is available on the Arid Recovery website at www.aridrecovery.org.au.

RESEARCH REPORT

Student projects

THREE STUDENTS from the University of Adelaide undertook projects at Arid Recovery over the past 12 months.

Predator interactions

Spatial and temporal interactions between Dingoes, Cats and Foxes in South Australia's arid zone.
Tina Schroeder, Honours candidate, University of Adelaide

FERAL CATS (*Felis catus*) and red foxes (*Vulpes vulpes*), two alien mesopredators, have significantly reduced small mammal and reptile populations across most parts of the Australian continent and contributed to recent mammal extinctions. Lately, it has been proposed that the dingo (*Canis lupus dingo*), Australia's top order predator has the potential to act as a biological control agent for introduced mesopredators. Dingo presence may reduce population levels of cats and foxes through interference competition or by changing behavioural patterns. Those competitive pressures reduce predation risk for small mammals and reptiles, hence dingo presence may be of benefit to threatened species populations.

This study tested how cats and foxes interact with dingoes by applying static (spatial) and dynamic (temporal and spatial) interaction analyses based on GPS location data of cats, foxes and dingoes recorded every 2 hours as part of the AR Dingo Project, undertaken at the Arid Recovery Reserve between 2008 - 2010.

The dynamic interaction analysis showed that dingoes and cats and dingoes and foxes do not associate more or less than expected by chance; however, static interaction analysis detected strong avoidance of high use dingo areas by cats and foxes. This suggests that avoidance patterns are not apparent at short temporal intervals, but do manifest on a larger spatial scale. Competitive pressures are placed on cats and foxes when trying to avoid high use dingo areas and therefore reduce access to resources. This might provide refuge areas for small mammals and reptiles in core dingo areas and ultimately benefit threatened prey species.

Browsing bettongs

Burrowing Bettong (*Bettongia lesueur*) browsing impacts.
Grant Linley, Honours candidate, University of Adelaide

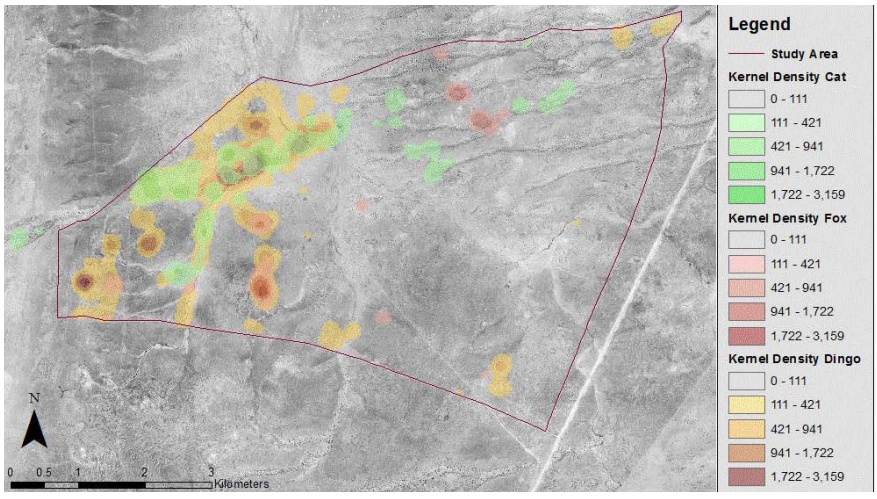
THIS STUDY aims to gauge the impact of Burrowing Bettongs (*Bettongia lesueur*) on vegetation within the AR Reserve by comparing vegetation damage inside and outside the fence. Bettongs are extremely well adapted to arid environments and can quickly increase their population in 'boom' years whilst also having the ability to make use of a range of vegetation types. Such adaptations, combined with the absence of a top order predator and the removal of the ability to naturally disperse has the potential to severely impact vegetation and other species within the Reserve. Data obtained in this study will assist Arid Recovery in their next steps to find a solution to controlling bettong numbers naturally.

Bird habitats

Ecology of shrub-dwelling birds at AR: influence of habitat structure.
Donna Belder, Honours candidate, University of Adelaide

THIS STUDY is investigating the habitat requirements of the Chestnut-rumped Thornbill (*Acanthiza uropygialis).* Declines in the abundance of this species in areas outside the AR Reserve have been identified via long-term monitoring, and no birds were detected in the past year. This absence of Chestnut-rumped Thornbills indicates possible differences in the quality of habitat for these birds inside and outside the Reserve. The results of the study will add to existing knowledge regarding the effects of changes in habitat on fauna in Australia's arid rangelands. Chestnut-rumped Thornbills, along with other small insectivorous species found in the arid zone, are declining in Australia. Understanding their habitat requirements is therefore of utmost importance for their conservation. If the Chestnut-rumped Thornbill is indeed found to require habitats protected from grazing, then this will further the case for widespread protection and rehabilitation of rangelands.

⬅ A Chestnut-rumped Thornbill
Photo by: Donna Belder



➡ Home ranges of Dingoes, Cats and Foxes based on Kernel Densities.
Image by: Tina Schroeder

AR RESERVE REPORT

Feral control

FOX INCURSION

ON THE 6TH of November, 2012, the unthinkable happened in the Reserve – the presence of fox tracks were discovered during a routine fence check by AR staff. The tracks were discovered after the carcass of a bettong was found on a track in the Northern Expansion. The following few weeks saw all Arid Recovery staff and a myriad of volunteers searching dunes, following tracks and discovering more dead bettongs. After just two weeks the tally of dead bettongs had reached 30 animals. All attempts to trap, bait and shoot the fox went to no avail. The presence of high numbers of bettongs hindered greatly the ability to both set traps and bait within the Reserve – with bettongs setting off or getting caught in traps and eating a number of baits laid for the fox. After numerous attempts, tracks were found leading towards the fenceline and outside the Reserve. Follow up searches, revealed tracks leading to and from the fenceline on both sides, suggesting that the fox had learnt how to successfully navigate over the floppy top and jump in and out of the Reserve. A great effort was made by Craig Wyatt, AR's Field Maintenance Officer, to heighten much of the western boundary fenceline along dunes and where sand build up had occurred. Some areas of the fence were extended to over 7 foot in height! Over the following weeks baiting occurred outside the fence, increased numbers of traps were set and the fenceline continued to be extended in height. A number of foxes were caught in traps or shot on the outside of the fence during and after this time, none were found to have bettongs in their gut contents and no further tracks were found inside the Reserve. A huge thanks must be given to the Arid Recovery staff who pulled together to work around the clock in an attempt to rid the Reserve of the fox. The final prey tally included a bilby, a bandicoot, over 50 bettongs, a number of hopping mice and a Bolam's mouse.

COST OF A FOX

ESTIMATED COST OF STAFF AND VOLUNTEER TIME:

$5420

⬅ 271 hours of monitoring after the first week of the fox incursion

⬇ After the first month of the fox incursion the prey toll had risen to:

BETTONGS **50+**

OTHER **4+**

⬅ A fox track inside the Reserve
Photo by: Anni Walsh

PERMANENT TRAP REPORT

THERE IS anecdotal evidence that suggests there has been an overall increase in cat tracks and numbers around the Reserve over the past 12 months. This correlates with an increase – from 1.56% in 2011-12 to 2.3% in 2012-13 – in the numbers of cats caught in permanent traps sites around the Reserve boundary.

Ongoing feral control around the Arid Recovery Reserve remains crucial. For the past 5 years we have had in place a remote monitoring system, developed by Observant, on 20 permanent trap sites around AR's feral free areas. The reliability of the Observant traps to date has allowed for highly successful feral control at the Reserve, that complies with our ethical requirements for trap checking. The remote monitoring has allowed a more cost effective way of undertaking feral control around the Reserve. Over time however, the internal components of the signal boxes have begun shutting down. From the initial 20 boxes purchased in 2007 currently only seven boxes remain online. Unfortunately, due to the age of the system at the Reserve, obtaining replacement parts for the out of service signal boxes has been unsuccessful to date. Arid Recovery is currently looking into options for upgrading to the new 3G system of Observant, or other alternatives that will allow for remote checking of traps.

ⓘ Further information regarding feral animals of the arid zone is available on the Arid Recovery website at www.aridrecovery.org.au.

DISSECTION DATA

➡ Animals found in the stomach contents of 174 feral cats and 32 foxes dissected by Arid Recovery in the past year.

MAMMALS **195**

BIRDS **16**

REPTILES **76**

AR RESERVE REPORT

Reserve report

WET WEATHER REPORT

ONCE AGAIN rainfall caused havoc for a short period of time, this year however, the rainfall was highest over the early months of Winter. This lead to minor road damage in and around the Reserve. The presence of researchers and volunteers working at the Reserve in these conditions led to the creation of a new wet weather procedure. This was to ensure the safety of all those staying at the Reserve and to retain the integrity of the Reserve's roads and tracks. The limited access around the Reserve boundary due to the wet weather also had an impact on the use of permanent traps around the Reserve reducing the number of nights they were opened.

TRAP NIGHTS

TOTAL TRAP NIGHTS
2115

CATS
49

FOXES
7

⬅ Number of predators captured in permanent trap sites around the Reserve.

FENCE REPORT

THE ANNUAL FENCE audit, was undertaken by Marty Kittle, Fence Maintenance Officer, and Craig Wyatt, Field Maintenance Officer in May 2013. On completion of the audit three crucial areas in need of repair were found where footnetting had rusted away and needed immediate replacement. The Field Maintenance Officer would like to thank the students from the Indigenous Ranger Cadetship Pilot Program from Port Lincoln High School who assisted with the fencing of these critical areas.

Another area of concern for the internal fence was the boundary of the first and northern expansions. There were increasing number of holes due to bettong activity and the perishing of foot netting in areas needing to be replaced. This was seen as a priority to ensure that in the event of an incursion of a rabbit (or rabbits) into the Reserve this fenceline would keep them isolated inside the one expansion allowing for quicker removal.

A 1.2m wide footnetting was chosen to complete the job and to secure the fenceline from damage by bettongs digging underneath. The total length of the repaired fenceline came to 4.2 kilometres, completed in good time thanks to the assistance of volunteers and the workers from the PREO Program.

➡ Bettong activity near an archeological site in the AR Reserve
⬅ Archaeologists at the AR Reserve
Photos by: HEH Archaeology

⬆ The Dingo Pen Dam, full after 45 mm of rain in June 2013.
Photo by: Anni Walsh

ARCHAEOLOGY REPORT

Between 25th September 2012 and 29th June 2013 an archaeological survey of the southern 25km² of the AR Reserve was undertaken by Huonbrook Environment & Heritage Pty Ltd (HEH). The project objective was to find and record archaeological sites within the southern section of the Arid Recovery Reserve that falls within the Olympic Dam mine expansion area.

The core team working on the project included the three HEH Aboriginal Archaeological Assistants who had worked on the archaeological salvage program at Olympic Dam from 2007 until 2013.

The survey recorded 1,010 sites within the area of the Reserve that included areas of the Main Exclosure and First Expansion. Throughout the survey it was found that the burrowing animals, specifically bettongs and bilbies, re-introduced into the Reserve have had a profound impact on the ground surface and in-turn the distribution of artefacts.

Discussions with HEH post-survey have found that there may be scope for research on the impact that small burrowing mammals have on archaeological sites. This type of research may provide important information in the future interpretation of buried layers of artefacts.

COMMUNITY REPORT

Community

OPEN DAY

THIS YEAR was Arid Recovery's 15th year of operation, and what a better way to celebrate than to have an Open Day at the Reserve. On a sunny day in August, past and present volunteers as well as visitors from the Roxby Downs community attended the outback style celebrations. Kanga bangas were sizzling on the bbq hot plate, as discussions of historic Arid Recovery achievements were had.

Construction of a giant wedge tailed eagle's nest kept the kids busy, and the creation of arid zone plant and animal collages revealed some enthusiastic young artists. Meanwhile families took the opportunity to see more of the Reserve with the tag along 4WD tours in operation. The return of KJ Kovak and Pete Paisley as tour guides was a highlight for a lot of visitors as they made their way along the interpretive nature trail. A wealth of knowledge was passed on, with first hand stories of the initial building stages and the re-introductions that have taken place at the Reserve. The opportunity for visitors to see the natural arid landscapes was topped off when our resident bilby Macca made a highly anticipated appearance! With Macca's assistance the cake was cut and celebrations were in full swing. Arid Recovery would love to take this opportunity to thank all of the enthusiastic volunteers for their support and dedication over the years, many of whom came back to celebrate with us or passed on their congratulatiosn for the day. Without these volunteers Arid Recovery would not be where it is today.

ⓘ The timeline of Arid Recovery's first 15 years can be found on pages 30 and 31 of this publication.

⬅ The wedge tailed eagles nest built at the AR Open Day

⬆ A tour taken by Pete Paisley on the Arid Recovery 15th Anniversary Open Day *Photos by: Hannah Spronk*

PEOPLE & EVENTS

NUMBER OF EVENTS
107

TOTAL ATTENDANCE
1592

TOTAL WEBSITE VISITS
177,241

⬅ Number of people at events and visitng the AR website over the past year.

➡ A word map of the Arid Recovery blog. There have been 52 blog posts in the Arid Recovery blog this year. The blog has had over 200,000 page views and is the most popular part of the Arid Recovery website.

COMMUNITY REPORT

Events

MAMMAL CONFERENCE TOUR

THE AUSTRALIAN MAMMAL CONFERENCE, held in Port Augusta in August 2012, included a post-conference trip to the Arid Recovery Reserve. AR staff met the tour group at the northernmost expansion of the reserve, to begin the tour with a brief outline of the AR Dingo Project. The tour group was shown one of the permanent trapping sites, giving a demonstration of the remote monitoring systems that are in place, followed by discussions of the issues of feral predators in the arid zone. The feral control efforts conducted by Arid Recovery was highlighted, with international attendees and delegates from other areas of Australia gaining an understanding of the devastating impacts that feral animals have on fragile arid zone ecosystems.

The group then embarked on a tour of the Reserve's nature trail, learning more about the unique arid zone environment and the operations of Arid Recovery. Many interested attendees led the way for intellectual discussion on plants and animals of the arid zone, an obvious passion for the group of enthusiasts.

The tour group stayed overnight at the Reserve, which included a trapping session which successfully captured bettongs and spinifex hopping mice – much to the pleasure of the avid mammalogists.

⬆ A makeshift Arid Recovery fence was built for the supporters event. *Photo courtesy of the Monitor Newspaper*

⬆ Field Officer Anni Walsh demostrates a cat trap around the AR Reserve with a remote monitoring system.

⬅ The Arid Recovery fence

Photos by: David Paull

SUPPORTERS NIGHT

ON WORLD ENVIRONMENT DAY in June 2013, Arid Recovery hosted a supporter's night to say thank you to the businesses and organisations that support our work. After recent rains prevented the event from being held at the Arid Recovery Reserve, the Olympic Dam Football Club kindly donated their clubrooms for the night.

The outdoor entertaining area was transformed to create an 'Arid Recovery experience', with a temporary floppy-top fence erected decorated with skins, furs, maps and posters. Resident bilby 'Charlie' as well as his taxidermied friends were gathered from their usual home at the local Visitor Information Centre and proudly put on display to show some of the local fauna that have established populations inside the Reserve.

About 45 guests braved the wintry conditions to gather for the event. As the spots of rain eased, guests gathered under the stars to be entertained by local musicians 'Who's on First' and to meet with other locals and businesses. Hungry bellies were satisfied with homemade pumpkin soup, gourmet kangaroo sausage and rocket rolls, and lamb cutlets with native herbs and spices, impressing all that attended.

Guests were from businesses from the Olympic Dam and Roxby Downs communities, and some special guests from Adelaide also attended the night. Arid Recovery Board Members Garry Winter and Professor Bob Hill, the new AR Board representative from the University of Adelaide, also made the trip to Roxby Downs to show their appreciation for the support that Arid Recovery receives.

COMMUNITY REPORT

Education

A RANGE OF education programs were advanced over the 2012-13 year. This has included the development of a hands-on learning program for indigenous students that builds on the field work undertaken at the Reserve, as well as school visits for local schools in Roxby Downs and intereactive displays for National Science Week activities in Adelaide.

INDIGENOUS RANGER CADETSHIP PILOT PROGRAM

STUDENTS TAKING part in the pilot program for the Indigenous Ranger Cadetship from Port Lincoln High School visited Arid Recovery in March 2013. The students conducted the field components of their studies to complete a certificate II in Conservation and Land Management. Students participated in various hands-on workshops to give them an idea of the monitoring, maintenance and research work that the team at Arid Recovery undertake on a daily basis. These workshops compliment the students' studies, and complete the components that they have been learning in the classroom.

➡ The Arid Recovery stall at Science Alive!
Photo by: Science Alive!
⬅ The Port Lincoln Highschool students assisting with vegetation removal and fence repair work.
⬇ A lesson in tracks as part of the Certificate II in Conservation and Land Management *Photos by: Martin Slattery*

SCIENCE ALIVE

IN AUGUST 2012, as part of National Science Week, Arid Recovery took part in the Science Alive! festival at the Wayville Showgrounds. Over 20,000 people visited the event over its 3 days. Science Alive offers a range of hands activities for children through to adults. There are presentations and booths from the local universities and various science organisations. The Arid Recovery booth was a hit with scat making and a hands-on display of skins and skulls!

OPERATIONS REPORT

2012-13 Financial Report

THE 2012-13 FINANCIAL year saw some major changes to both the Arid Recovery business model and the opportunities that were forecast due to the planned expansion of the Olympic Dam mine. In April 2012, the AR Board made the decision to budget for potential business development opportunities throughout the 2012-13 financial year. This was based on the the 2012-17 AR BP developed in 2011-12 and a number of forthcoming opportunities for service provision of land management and contracting. Unfortunately due to the postponement of the Olympic Dam mine expansion the opportunity for this type of revenue raising opportunities ceased in 2013.

FULL FINANCIAL AND AUDIT REPORT

ARID RECOVERY accounts are audited each year by Ernst and Young. The full audited financial report can be found on the Arid Recovery website at www.aridrecovery.org.au.

Balance sheet

ASSETS		
CURRENT ASSETS	**2013**	**2012**
Cash and cash equivalents	$270,776	$385,096
Trade and other receivables	$3,596	$22,337
Inventories	$22,150	$1,781
TOTAL EQUITY		**$409,214**
NON-CURRENT ASSETS		
Plant and equipment	$51,542	$65,616
TOTAL NON-CURRENT ASSETS	$51,542	$65,616
TOTAL ASSETS	**$318,064**	**$474,830**
LIABILITIES		
CURRENT LIABILITIES		
Trade and other payables	$15,641	$26,852
NAB - Credit Card	$2,989	3,678
Provision for annual leave	$23,773	$15,307
TOTAL CURRENT LIABILITIES	$42,403	$42,159
TOTAL NET ASSETS	**$305,661**	**$432,671**
TRUST FUNDS		
Retained earnings	$305,661	$432,671
TOTAL FUNDS	**$305,661**	**$432,671**

FUNDRAISING AND IN-KIND SUPPORT

IN-KIND SUPPORT from local businesses in Roxby Downs is an essential component to the success of Arid Recovery. As part of this years events, a supporters thank you event was held in Roxby Downs to thank all those businesses who continue to support Arid Recovery, especially through the difficult year that has been seen over the past 12 months.

⬇ The team from Broadspectrum helping out fencing at the Reserve
Photo by: Anni Walsh

Profit and loss

REVENUE	2013	2012
Interest received	$14,184	$26,432
Sponsorship contributions	$400,000	$400,000
Grants	$51,315*	$99,650*
Fundraising income	$17,986	$56,888
Education & consultancy	$73,271	$43,397
Other income	$27,522	$46,946
Total income	**$584,278**	**$673,313**
OPERATING EXPENSES		
Staffing costs	**($**468,527)	($435,631)
Project expenses	**($**109,620)	($69,525)
Vehicle expenses	**($**31,333)	($29,228)
Depreciation	**($**18,484)	($17,155)
Administration and other	**($**83,323)	($79,897)
Total operating expenses	**($711,287)**	**($631,436)**
NET PROFIT / (LOSS)	**($127,009)**	**$41,877**

** 2012 & 2013 DEWNR partnership funding received in 2012 financial year*

Inside the fence

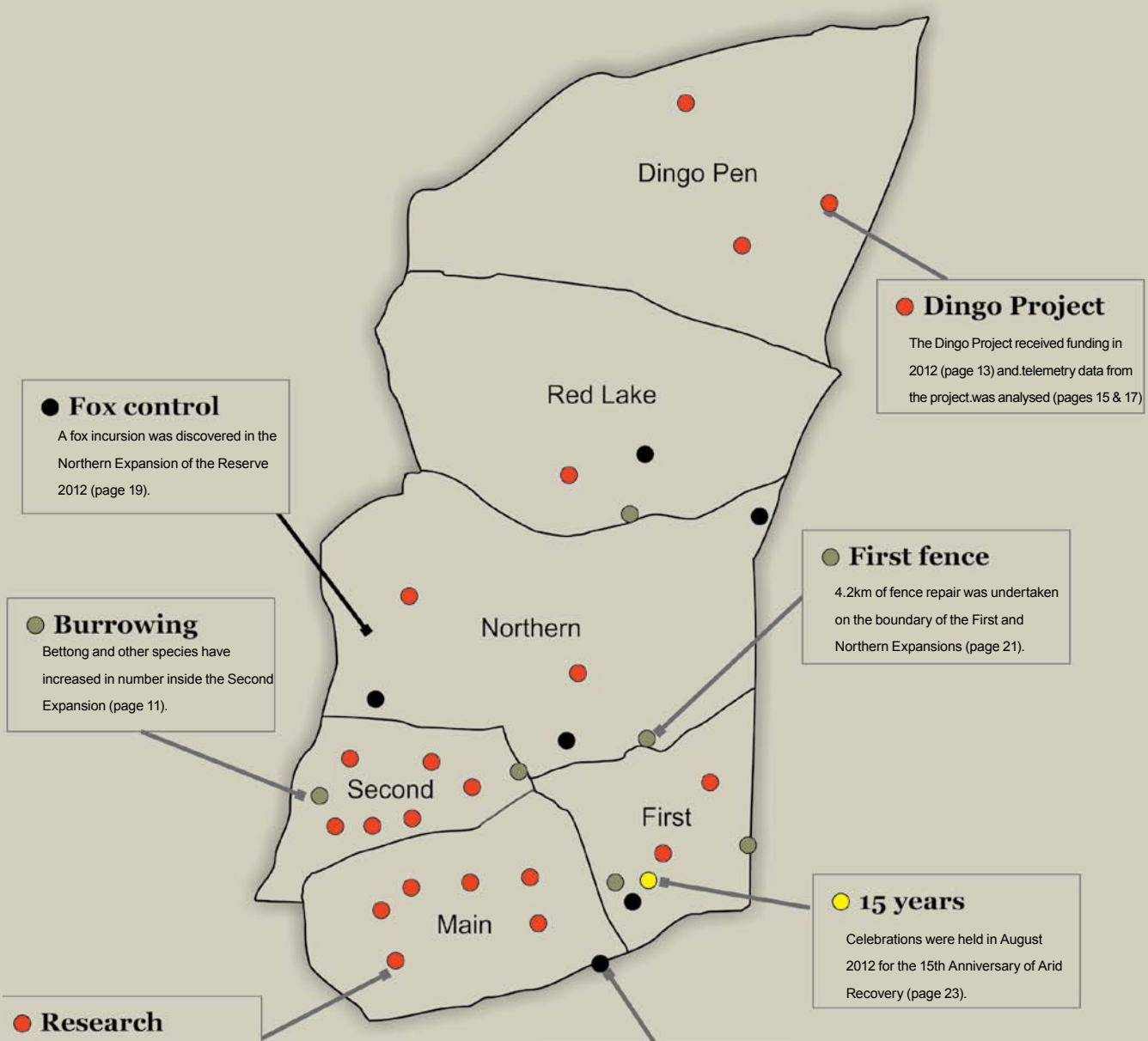
Research remains the focus of the work undertaken by staff, researchers and volunteers at the Arid Recovery Reserve. In the past 12 months a number of research projects have utilised areas of the Reserve, including our long-term monitoring programs, student and AR research projects.

Research
➡ Pages 12 - 17
Research undertook a review and new students began and completed projects at the Reserve.

Community
➡ Pages 22 - 27
Community events took us from the Reserve to Roxby, Andamooka, Woomera and the big city of Adelaide.

Feral control
➡ Pages 18-19 & 21
Feral control went to new heights following a fox incursion in the Reserve.

Reserve
➡ Pages 8-11 & 21
Major fence repairs were undertaken in response to increased bettong populations.



OPERATIONS REPORT

2012-13 Operational Plan

The following objectives were identified by the Arid Recovery Board for the 2012-13 year. These objectives are reported on quarterly to the Board and form part of the annual work plan undertaken by Arid Recovery staff.

Area	Overall 2012-13	Task/Objective
Safety & administration	✓	*Implementated WHS plan, review of financial and governance compliance issues including new auditors in place*
Conservation & research	→	*Development of AR research strategy, internal fences of feral free area of Reserve repaired and improved*
Community	✓	*Undertook education programs at the Reserve as part of the Indigenous Cadet Ranger Pilot Program*
Publicity	→	*Income targets met for tours and events but attendance numbers and membership retention down*
Business plan	✓	*New sponsorship agreement with BHPB signed for 3 years. New participation agreement with partners drafted, DEWNR onto AR Board as full member partner*

2013-14 Operational Plan

IN JUNE A planning day was held with all AR staff to review the current strategic plan and look at areas of improvement to add to the 2013-14 work and operational plans. It was decided that the current workplan would be reviewed and developed for 2013-14 in-line with the AR strategic objectives.

Operational plan and KPI's will be amended to fit within these objectives to enable better workflow. Proposed operational plan target areas are shown in the table below.

Area	Task/Objective
Conservation and restoration	*Implementation of new management plans for threatened species, feral free area of Reserve extended, feral controlled area around Reserve extended*
Research and monitoring	*Development of AR research strategy including grant opportunities with University of Adelaide, implementation of revised monitoring (specifically vegetation & annual monitoring)*
Expansion and demonstration	*Building of external pastoral opportunities (NRM activities) and scoping of management opportunities for BHPB properties*
Education and training	*Development of new school & community programs (including outreach) and Reserve training programs (including indigenous and monitoring)*
Community	*Increased attendances, increase membership retention, increased publicity through marketing/communications and outreach strategy*
Building a robust development	*Review of strategic plan & business plan, retention of staff, development of tourism strategy, increase in grant and funding opportunities, maintenance of governance and WHS practices*

Thank you to the sponsors and supporters of Arid Recovery:

Arid Recovery is a conservation initiative supported by BHP Billiton, the SA Department of Environment, Water and Natural Resources, the University of Adelaide and the local community.

Thanks to the many organisations who have assisted us over the past 12 months and continue to support the work of Arid Recovery:

Alliance Airlines
Blackwoods
CEG
Coates Hire
Cowell Electric
EnSystex
Ernst & Young
Fauna & Flora International
Global Leadership Foundation
Group GH
Greyhound Australia
Johnston & Withers
Kelly&Co Lawyers
MFP Insurance
Monadelphous Engineering
The Monitor Newspaper
National Science Week
ODT Australis
Roxby Downs Motor Inn
Roxby Leisure
Roxby Pest Management
RoxFM
SAAL NRM Board
Sodexo
Who's on First
Woolworths

You can assist the ongoing work of Arid Recovery through a variety of ways. Visit the website or contact the Arid Recovery Office on 08 8671 2402 for further information.

Volunteer

Join us for a working bee or assist around the office, there are many opportunities to volunteer with the staff of Arid Recovery.

Join

Become a member of Arid Recovery for as little as $25 a year and receive our quarterly newsletters and monthly e-news updates.

The Arid Recovery Reserve floppy top
Photo by Arid Recovery

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