



On Track

Delivering natural resource management
in the SA Arid Lands 2012-13

Protecting our land, plants
and animals

Understanding and securing
our water resources

Supporting our industries
and communities



Australian Government



Government of South Australia
South Australian Arid Lands Natural
Resources Management Board



Welcome

PAUL WAINWRIGHT

Welcome to the third edition of *On Track*.

It's been another busy year for the South Australian Arid Lands (SAAL) Natural Resources Management (NRM) Board, and on behalf of the Board I am pleased to release *On Track*, our annual report to our community and partners on the important achievements which deliver on our goals defined in the *SAAL Regional NRM Plan*.

True to the guiding role of the Board and our Plan, *On Track* again pays tribute to the wide variety of organisations and individuals who are contributing to natural resource management in the SA Arid Lands region and helping to meet our targets.

Collectively, we work to manage our region's pest plants and animals, protect our threatened species, rehabilitate our land, conserve our valuable soils and manage our precious water resources.

Our Board itself has had several major achievements this year.

We formalised our working relationship with the Pastoral Board and the Native Vegetation Council, two other bodies who have legal responsibilities associated with land management in our region.

In essence, we have agreed to work closely together, to create efficiencies through developing consistent policy and coordinating our consultation efforts to improve delivery of information and services to the community.

The Board also took a strategic look ahead, updating its Business Plan to define its priorities for the next three years. These priorities are reviewed annually in consultation with our NRM Groups and partners to ensure they remain current.

Our current priorities include delivering on-ground results, developing community partnerships, investing in research, looking at innovative approaches to community involvement, securing funding for our key projects, and meeting our legal responsibilities surrounding the management of natural resources.

On behalf of the Board, I thank our land managers, community, volunteers, NRM Groups, levy-payers, funding bodies and partner organisations for their efforts in contributing to the sustainable management of our region's natural resources and I look forward to your continued support and involvement.

Enjoy the read.



Janet Brook
Presiding Member,
SA Arid Lands
Natural Resources
Management Board

Front page photo: Warburton Creek



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KAREN ENGLISH



A Bettong



Arckaringa Daisy

D. DUVAL



Cattle yard, Innamincka

KAREN ENGLISH

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Our region

The SA Arid Lands region covers over half of South Australia and includes some of the driest parts of the State.

The region's environment is characterised by irregular rainfall and other episodic weather events that rarely follow predictable annual cycles and it has the largest percentage of intact ecosystems and biodiversity in SA.

In this region more than any other, communities and industries are intrinsically linked to the environment and rely on integrated natural resource management to maintain healthy functioning ecosystems.

Water is a critical resource supporting biodiversity, communities and industries. Most water supplies in the region are sourced from the Great Artesian Basin, one of the world's largest underground water reservoirs.

The human population in this arid and semi-arid region is small – less than 2 per cent of the State – and geographically dispersed. A number of landholdings, including parks, reserves and pastoral leases, are under Aboriginal management or co-management. The majority of towns have less than 1000 occupants, while the largest towns – Coober Pedy and Roxby Downs – are both associated with mining and home to less than 5000 people.

Pastoralism remains the dominant land use, with vast tracts of the region – over 40,000,000 hectares – taken up by sheep and cattle stations relying on native vegetation for feed.

Although much smaller in area occupied, the mining, gas and petroleum industries have become increasingly significant land users.

Tourism has also exploded in recent years as unprecedented numbers of people visit the region to enjoy the outback experience. This includes some of SA's most environmentally significant conservation reserves and national parks, and the great inland water system of Kati Thanda-Lake Eyre.



Our Plan for the region

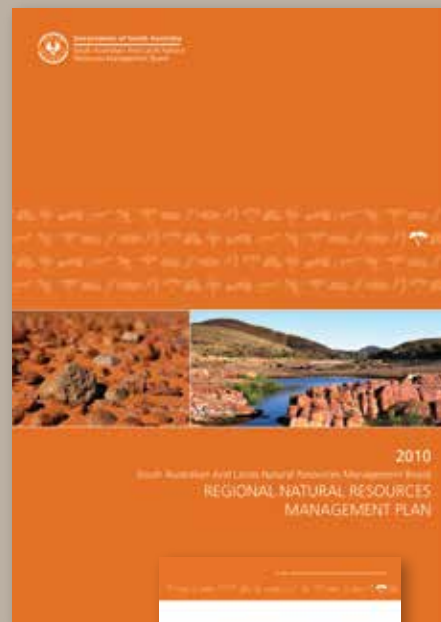
The SAAL Regional NRM Plan is pivotal to achieving better management of the region's natural assets as it outlines priorities and provides direction for all partners who invest in the region. Collaboration is the key to its effective delivery, so the SAAL NRM Board works closely with community groups, industry, government agencies, and individuals.

This edition of *On Track* showcases these collaborative efforts towards improving the condition of regional natural resource management during 2012-13 and towards achieving the short and long-term targets contained in the SAAL Regional NRM Plan.

The SAAL Regional NRM Plan was adopted by the Minister for Sustainability, Environment and Conservation in August 2010 and outlines a range of programs and associated targets to achieve better protection of ground and surface water; ensure sustainable industries; achieve best practice management of pastoral lands; conserve natural ecosystems and biodiversity; and encourage community participation.

It consists of two volumes: Volume 1 details the state of the region assessment, the policy and regulatory framework, and a 10-year Strategic Plan, including targets. Volume 2 describes the SAAL NRM Board's contribution towards achieving the region's vision and targets through its own actions and investments.

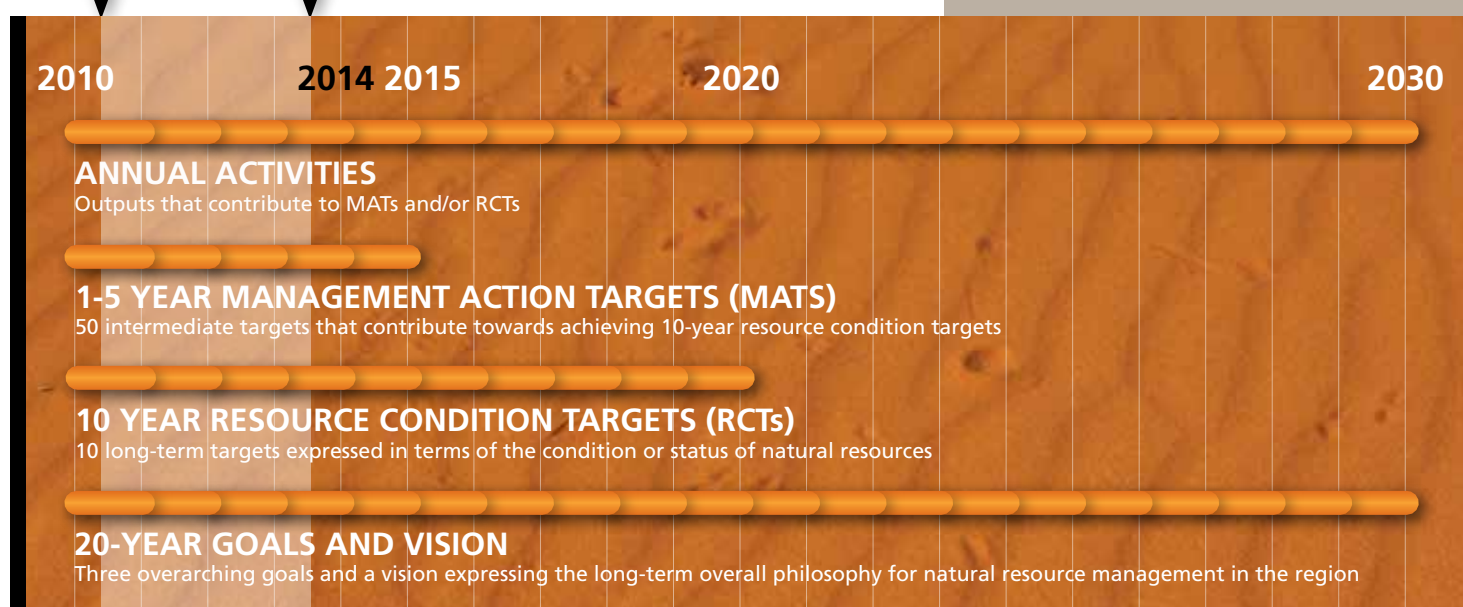
The first five-year review of the SAAL Regional NRM Plan will commence in August 2013, with the revised plan scheduled for completion mid-2015. Further information about the SAAL Regional NRM Plan review and opportunities to have your say on regional natural resource management will be featured in future editions of *Across the Outback*.



Contact Natural Resources SA Arid Lands 8648 5300 for your copy of the SAAL Regional NRM Plan

SAAL Regional NRM Plan adopted

THIRD ON TRACK
 Highlight all activities contributing towards SAAL Regional NRM Plan targets
 WE ARE HERE (end of year 3)



Our stakeholders

Natural resource management is about working with people – our industries and our communities – to ensure the sustainable use of our precious resources – our water, soils, plants and animals. It's about striking a balance between the economic, social and environmental outcomes we derive from our natural resources and between biodiversity and production benefits.

As we all depend on our natural resources, everyone with an interest in the SA Arid Lands has a stake in their sustainable management. Here we highlight those individuals, organisations and agencies whose **on-ground activities** are contributing towards achieving the targets in the *SAAL Regional NRM Plan*.

INDUSTRY GROUPS AND PEAK BODIES

Mining industry – avoid or minimise their impacts on natural resources and by investing in environmental projects to offset any damage that is caused (eg Santos, OZ Minerals, SA Chamber of Mines and Energy)

Pastoral industry – employ good land management practices to prevent degradation and improve land condition where possible (eg Primary Producers SA, S Kidman and Co, Outback Lakes SA)

Tourism industry – ensure their members are well-informed about appropriate behaviours to avoid causing impact to natural resources (eg Flinders Ranges Tourism Operators Association, Regional Development Australia Far North, SA Tourism Commission)

COMMUNITY GROUPS/ NGOs

Community groups – environmental or special interest groups contributing through on-ground works aimed at conserving and protecting natural resources in the region (eg Progress Associations, Blinman-Parachilna Pest Plant Control Group, 4WDSA, Friends of Parks groups)

Non-government organisations – not-for-profit organisations that are strengthening local communities and/or preserving natural resources in the region (eg Conservation Council of SA, Arid Recovery, Bush Heritage Australia, Nature Foundation SA)

ABORIGINAL GROUPS AND PEAK BODIES

Communities, organisations, agencies and authorities that represent the interests of Traditional Owners, promote native title rights and interests, and/or manage lands (eg South Australian Native Title Services, Aboriginal Lands Trust, native title groups, Co-management Boards, Department of Aboriginal Affairs and Reconciliation)

STATE GOVERNMENT AGENCIES AND STATUTORY AUTHORITIES

Biosecurity SA (part of Department of Primary Industries and Regions) – works with other government departments, industry and communities to manage the risks and potential harm to our community, our environment and economy from pests and diseases, or misuse of agricultural and veterinary chemicals

Department of Environment, Water and Natural Resources (DEWNR) – delivers activities on behalf of the SAAL NRM Board through the regional delivery agent Natural Resources SA Arid Lands. At a state level, contributes towards water security, climate change, sustainable land management, public estate management and biodiversity conservation to achieve productive and balanced use of natural resources and to help improve the condition and resilience of our natural systems

Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) – leverages value from major projects, such as mining, for SA

Department of Planning, Transport and Infrastructure (DPTI) – supports transport services and strategic project delivery that minimises unnecessary impacts to natural resources

Dog Fence Board – maintains the Dog Fence in SA

Environment Protection Authority (EPA) – works with other government departments, industry and community to protect air and water quality, and control pollution, waste, noise and radiation

Native Vegetation Council – provides advice and makes decisions about the removal and re-establishment of native vegetation in line with the *Native Vegetation Act 1991*

NRM Council – advises the State Government about the long term strategic directions for the management of the State's natural resources, and works with key stakeholders, including NRM Boards, peak bodies and other State Government agencies, to implement the State NRM Plan

Outback Communities Authority – manages and promotes improvements in the provision of public services and facilities to outback communities, as well as articulating the views, interests and aspirations of outback communities

Pastoral Board – administers the pastoral lease system, determining and managing compliance with lease terms and conditions

SA Research and Development Institute (SARDI) – provides robust scientific solutions for primary industries



DID WE MISS YOU?

There are many individuals and organisations contributing to the sustainable use of our natural resources, more than we can possibly acknowledge here. If we have missed you, the SAAL NRM Board thanks you for your contribution to natural resource management in the region and invites you to contact Natural Resources SA Arid Lands by **30 August 2014** to tell us about your 2013-14 activities.

Email SAAridlands@sa.gov.au or on 8648 5300

NATIONAL BODIES AND GOVERNMENT DEPARTMENTS

Great Artesian Basin Coordinating Committee (GABCC) – provides advice from community organisations and agencies to Ministers on a sustainable, whole-of-resource approach to Great Artesian Basin management and coordinates cross-border activities

Invasive Animals CRC – develops tools to prevent and detect new invasions and integrated management tools and strategies for major pest animals

Lake Eyre Basin Community Advisory Committee (LEBCAC) – provides advice from the Lake Eyre Basin community to the Lake Eyre Basin Ministerial Forum and feeds back the decisions and activities of the Ministerial Forum to the Basin community

Lake Eyre Basin Ministerial Forum (LEBMF) – implements the Lake Eyre Basin Agreement, a cooperative framework for jointly addressing cross-border issues about the management of water and related natural resources within the Agreement area

National Water Commission – drives national water reform by providing independent, evidence-based, scientific advice to the Australian Government

Rangelands NRM Alliance – assists with cross-regional collaboration and raising awareness of rangelands issues at a national level

EDUCATION BODIES

Schools – provide remote, or face-to-face instruction to children on a range of subjects and activities (eg Marree Aboriginal School, Port Augusta Campus School of the Air)

Universities – supports innovative research activities and project delivery, such as remote sensing, threatened species recovery, and ecological restoration (eg Flinders University of SA, University of Adelaide, UniSA)

FUNDING SOURCES

Australian Government – there are a range of funding sources available through the Australian Government, most of which support delivery of activities in the *SAAL Regional NRM Plan* (eg Caring for our Country, Community Action Grants, Land Sector Package)

Industry – some activities delivering on the *SAAL Regional NRM Plan* are partly funded through industry (eg Sheep Industry Fund, Santos, Australian Wool Innovation)

NRM Levy ratepayers – all landholders (including lessees) in the SA Arid Lands region pay a Regional (land-based) NRM levy while an NRM water levy is payable on water allocated to the mining, energy, gas and petroleum sector, town water suppliers, irrigators, and commercial operators in the Far North Prescribed Wells Area (see p. 42 for further information)

State Government allocation – specific funding is allocated to each NRM region to cover some costs associated with running an NRM Board and NRM Groups

State Government grants – when available, these can be applied for to support the delivery of activities associated with the *SAAL Regional NRM Plan* (eg State Community NRM Grants, Native Vegetation Council Significant Environmental Benefits Grants)

A NOTE ON RESEARCH OUTPUTS

There are a range of other research programs, initiatives and organisations that operate at a State and/or national level (eg Terrestrial Ecosystem Research Network, Transect for Environmental Monitoring and Decision-making, Goyder Institute, Commonwealth Scientific and Industrial Research Organisation, and the Bureau of Meteorology). Their research outputs may inform on-ground activities in the region and their efforts are acknowledged, but not specifically addressed, in *On Track* which focuses on on-ground activities.

Our land & biodiversity

163 properties participated in **309** pest animal management activities across **3,742,259** hectares

48 properties participated in **66** weed management activities across **326,939** hectares

17 properties covering **4,690,362** hectares participated in integrated property planning

Maintaining the soils, native vegetation and native wildlife in the SA Arid Lands region is critical to the sustainability of our industries and communities.

The region contains some of the State’s most environmentally significant and iconic terrestrial ecosystems including Sandy Deserts, Stony Plains, and the Gawler, Flinders and Olary Ranges. These ecosystems are home to a range of unique plants and animals, many found only within this region. They also support our tourism industry which sees thousands of people flock here each year to enjoy our special and diverse landscapes and native wildlife.

The production of cattle and sheep here is solely dependent on native vegetation as the grazing resource. Pastoralists, by far the largest land users, are legally responsible for maintaining land condition which means managing the pressure on native vegetation from the grazing of their stock but also from feral herbivores such as goats, camels, donkeys, horses and rabbits. Other pest animals include cats, pigs, foxes and, where they occur south of the Dog Fence, wild dogs.

Declared weeds occupy thousands of hectares of grazing land, undermining the long-term sustainability of pastoral production and biodiversity values of infested areas – two of these,

African Boxthorn and Opuntoid Cactus species, were added to the Weeds of National Significance program this year.

There are also emerging weedy threats such as Pepper Trees and Buffel Grass. While their current distribution and density is limited in SA, further introductions or spread of these weeds could occur via floodwaters, livestock movements or other means.

Many organisations and individuals are working to gain a better understanding of the native plant and animal communities in the SA Arid Lands region. The key to their conservation relies on good land condition and in particular, healthy and sustainable ecosystems where key threatening processes such as pest plants and animals and soil erosion are managed effectively.

Through our work with land managers to undertake on-ground activities to reduce threats and restore ecosystems, we are finding the balance between biodiversity management and pastoral production.

10 YEAR RESOURCE CONDITION TARGETS

1. Improve the average extent and condition of native vegetation

2. Maintain or reduce the risks to all species and ecological communities

4. Improve the condition of at least 50% of culturally-significant natural ecosystems which are suffering from disturbance

5. Reduce human-induced soil erosion

6. Maintain or improve the ecological sustainability of natural resource-based industries

Threatened fauna research & recovery

BUSH HERITAGE RESERVES

Bon Bon Station Reserve

A total of 1540 hectares of Buffel Grass was treated along the Old and New Stuart Highway and the property set up a herbicide trial with plans to trial fire next year. Through the Buffel Grass Action Group, Bon Bon liaised with the Roxby Downs-based Buffel Busters to pool resources and maximise strategic control.

Bon Bon continued to map rabbit warrens in priority land systems, covering 33,000 hectares to date, and strategic control is planned for 2014.

Bird surveys revealed a boost in the reserve's capacity to support migratory insectivorous birds (eg various honeyeaters, chats and songlarks) with these birds breeding in large numbers. Trapping surveys conducted with volunteer assistance also recorded the presence of the Ooldea Dunnart and the Inland Sandy Mouse for the first time. Other activities included monitoring of vegetation across 54 sites, maintenance of approximately 100 kilometres of strategic fire breaks, fox baiting and kangaroo surveys.

Boolcoommatta Station Reserve

African Boxthorn and Pepper Tree control was undertaken through membership of the Olary Weed Management Group (see p. 14) and through about 1000 hours of volunteer assistance; 7000 rabbit warrens were destroyed; 16 telemetry equipped soft jaw traps were deployed to target cats; and goat, fox, cat and rabbit control was carried out by Sporting Shooters Association Australia.

Bird surveys revealed reduced populations of both resident and migratory birds, the result of an extended dry spell at Boolcoommatta and substantially reduced herbaceous growth. Other activities included vegetation monitoring across 51 sites; kangaroo surveys which recorded high numbers of Red and Western Grey Kangaroos and Euros; aerial fox baiting as part of *Bounceback* (see p. 9) and a monthly ground baiting program supported by 220 fox bait stations.

Bush Heritage Australia, Native Vegetation Council, SAAL NRM Board, Natural Resources SA Arid Lands, Sporting Shooters Association, SA Field Naturalists, Department of Planning, Transport and Infrastructure, Biosecurity SA, Letcombe Trust, Australian Government

NATURE FOUNDATION SA RESERVES

Witchelina Nature Reserve

Two studies commenced this year: one investigating the ecology, behaviour and genetics of the Thick-billed Grasswren and another exploring the properties' soil seedbank to understand how native vegetation responds to changes such as de-stocking and climate change, and to assist revegetation efforts. The annual bird survey of the major habitats on the property is providing useful information regarding seasonal changes and species abundance. Rabbit warren mapping and ripping occurred across 1200 hectares of chenopod shrublands.

Hiltaba Nature Reserve

Bushblitz – Australia's largest nature discovery project – helped create a plant and animal inventory. In April 30 volunteers from the Scientific Exploration Group established a baseline fauna survey which revealed the Slender-billed Thornbill is vulnerable to extinction because its preferred habitat has been altered by grazing. Rockhole restoration also occurred in conjunction with Traditional Owners and using indigenous employment (see p. 36).

Both properties participated in fox, goat, cat and rabbit control and Yellow-footed Rock-wallaby monitoring through *Bounceback* (see p. 9) and wild dog ground and aerial baiting (see p. 17). A total of 817 goats, 169 rabbits, 107 cats, 72 foxes, and 13 wild dogs were removed during the year.

Former sheep pastoral stations turned nature reserves, Witchelina (North Flinders district) and Hiltaba (Gawler Ranges district), were bought by Nature Foundation SA in 2010 and 2012.

Nature Foundation SA, Pastoral Board, Flinders University, Bushblitz, Scientific Exploration Group, South Australian Native Title Service, SAAL NRM Board, Natural Resources SA Arid Lands, Biosecurity SA, Australian Government



Stripe-faced Dunnart

ARID RECOVERY

ANNUAL TRAPPING AT ARID RECOVERY

Numbers were down on last year, but Arid Recovery's 16th consecutive annual trapping program still caught a variety of species, including five species of mammals and 13 species of reptiles.

Hopping Mouse and the nationally vulnerable Plains Rat were the most abundant mammal captures, while the skinks made up half of the reptile captures.

One of the longest running programs of its kind in Australia, the collected data highlights the impact that feral predators such as cats and foxes may have on the native small mammals and reptiles in the arid zone.

Threatened fauna research & recovery

MARSUPIAL MOLE

Seven Friends of Simpson Desert Parks volunteers searched for the elusive Marsupial Mole, digging 40 one-metre-long trenches in sandhills across the western Simpson Desert. This species spends most of its life beneath the sand and is rarely seen on the surface.

The trenches allow for the detection of the moles' backfilled tunnels and are the only way to detect their presence. Mole signs were found in just four trenches, but this confirmed their continued presence in the western Simpson Desert.

SAAL NRM Board, *Natural Resources SA Arid Lands, Australian Government*

GREY GRASSWREN

The first major works on the Grey Grasswren, a nationally vulnerable species, were completed this year. This small, elusive bird inhabits floodplain vegetation including Lignum and Old Man Saltbush in the major inland rivers of the Channel Country.

Surveys of Diamantina River, Eyre Creek and Cooper Creek floodplains in northern SA and adjacent areas of Qld suggest that Grey Grasswrens are relatively common at Goyder Lagoon but absent or in very low numbers at similar upstream floodplain sites.

Work is underway to determine if the isolated (and perhaps declining) populations at upstream floodplain sites are genetically distinct and require special effort to conserve.

SAAL NRM Board, *Natural Resources SA Arid Lands, Andrew Black, Graham Carpenter, Lynn Pedler, Roger Jaensch, Australian Government*

PLAINS MOUSE

Four Plains Mouse, a native rodent, were found in a survey mounted after finding remains in a dingo scat at Quinyambie Station, over 300 kilometres east of previous records.

Plains Mouse have previously been found in cracking clay areas in the stony plains belt stretching from the western side of Lake Torrens, north to Oodnadatta, and southern NT.

This find, along with other recent records from the west of Lake Frome, is causing a rethink of Plains Mouse distribution and habitat tolerance.

SAAL NRM Board, *Natural Resources SA Arid Lands, Rick Barratt, Karen Harris, Australian Government*

AMPURTA

Good numbers of Ampurta, a small carnivorous marsupial, were found during surveys of 130 sites in sandy terrain between Oodnadatta and the lower Birdsville Track.

Sites first surveyed in 2006 were revisited, with the distribution of Ampurta signs (tracks, scats or burrows) suggesting their range is likely to be stable or possibly slightly increasing. Evidence was also found at a site about 50 kilometres south of previous records. This suggests Ampurtas may be reinhabiting parts of their former range, possibly because of lower rabbit numbers brought about by calicivirus.

SAAL NRM Board, *Natural Resources SA Arid Lands, Katherine Moseby, Andrea Tschirner, John Read, Australian Government*

BRONZEBACK LEGLESS LIZARD

Local volunteers spent three days searching leaf litter at Evelyn Downs Station for the evasive Bronzeback Legless Lizard. This poorly understood species lives under the thick leaf litter mats beneath Gidgee and Myall trees in the Breakaway country north of Coober Pedy.

The volunteers from Coober Pedy and neighbouring Mt Willoughby Station Indigenous Protected Area had previously uncovered a record 15 Bronzebacks at Mt Willoughby in March 2012.

The single Bronzeback captured at Evelyn Downs was important in building knowledge of the species' preferred habitat and the times it is active within the leaf litter.

SAAL NRM Board, *Natural Resources SA Arid Lands, Aaron Fenner, Australian Government*

THANK YOU
Thanks to the 15 volunteers who assisted this work and the managers and owners of the 31 pastoral properties involved

YELLOW-FOOTED ROCK WALLABY

Yellow-footed Rock-wallaby recovery continued as part of Bounceback (see p. 9).



KOWARI

Over 60 Kowaris were captured during monitoring surveys across their known range along the Birdsville Track where they are continuing to hang on in one of the toughest environments imaginable.

The April 2013 results contrast with very low Kowari capture rates during 2011 surveys when native Long-haired Rats were in the middle of a major plague in response to the exceptional rainfall and flooding. The carnivorous Kowaris, which are not much bigger than a rat, probably benefited from the Long-haired Rat plague, eating and breeding well in late 2012.

SAAL NRM Board, *Natural Resources SA Arid Lands, Australian Government*

Bounceback

Bounceback celebrated its 20th anniversary in July 2012 with 60 past and current *Bounceback* partners gathering to celebrate the program's successes at the Old Wilpena Homestead.

The program operates across a range of landholdings, including National Parks, non-government owned reserved and pastoral properties in the Flinders, Gawler, and Olary Ranges where it aims to restore habitats and foster recovery of native animal populations.

Bounceback's broadscale 1080 baiting has significantly reduced losses of young Yellow-footed Rock-wallabies to fox predation.

The removal of goats from the landscape has not only benefited the wallabies by reducing competition for food, but also assisted the regeneration of native vegetation. Here's a snapshot of *Bounceback's* main achievements for 2012-13.

Goats

The annual aerial goat removal program occurred in March in the North Flinders and North East Pastoral districts removing 4646 goats from 15 properties and the Flinders Ranges National Park, Vulkathunha-Gammon Ranges National Park and Bimbowrie Conservation Park.

The aerial program complements ground control undertaken on parks throughout the *Bounceback* target area by the Sporting Shooters Association of Australia (Hunting and Conservation Branch), Natural Resources SA Arid Lands staff, and a contractor. This year 3907 goats were removed from the Gawler Ranges and Flinders Ranges National Parks and Bimbowrie Conservation Park.

The long term results show a steady decline in goat numbers on target properties and the regeneration of native shrub and tree species, particularly those that have been removed or damaged by goat browse.

Natural Resources SA Arid Lands, SAAL NRM Board, Adnyamathanha community, Landscape Partnerships, Australian Wildlife Conservancy, Biosecurity SA, Bush Heritage Australia, Conservation Volunteers Australia, Nature Foundation SA, Sporting Shooters Association, Yellow-footed Rock-wallaby Preservation Association, Zoos SA, local land managers, tourism operators, Australian Government



Bounceback 20-year celebrations at the Old Wilpena Homestead

Foxes

Aerial fox baiting was carried out in August 2012 and February 2013 across about 700,000 hectares in the North Flinders, Gawler Ranges and North East Pastoral districts.

The baiting occurred across public reserves (Flinders Ranges National Park, Bunkers Conservation Reserve, Vulkathunha-Gammon Ranges National Park) and neighbouring pastoral properties, as well as Nantawarrina Indigenous Protected Area in the North Flinders; Bimbowrie Conservation Park and Boolcoomatta Reserve in the North East Pastoral district; and Gawler Ranges National Park, Pinkawillinie Conservation Park and Hiltaba Nature Reserve in the Gawler Ranges district.

The aerial baiting was followed up by ground baiting in November 2012 and May 2013. In total, 99,000 baits were dispersed across the *Bounceback* footprint in the SA Arid Lands region.

Spotlight monitoring transects indicate that the baiting program continues to reduce fox incursions into the baited areas to very low numbers while camera monitoring is indicating that the program is just as effective in well wooded and the steep rocky parts of the ranges.

Monitoring predators

The Sporting Shooter Association of Australia (Hunting and Conservation Branch) and Natural Resources SA Arid Lands staff removed 64 cats, 22 foxes and three wild dogs as part of quarterly spotlight destructive surveys and through opportunistic control. The spotlight surveys contribute to an 18 year monitoring dataset that records fox and cat response to 1080 baiting. Surveys occur on Flinders Ranges National Park, which is regularly baited for foxes, and adjacent and distant properties that are not regularly baited for foxes, allowing a comparison of predator numbers.

Yellow-footed Rock-wallabies

Trapping in the Gawler Ranges confirms the steady recovery of Yellow-footed Rock-wallaby populations. Seven individuals were caught near Stone Dam, some kilometres east of previously recorded locations in the western Gawler Ranges National Park. Adult females with pouch young and juveniles were also present.

Monitoring on Hiltaba Station also revealed females with pouch young and juvenile wallabies. This is the first sign in recent times that the Yellow-footed Rock-wallaby population is beginning to recover on this property, raising hopes that this population will become sustainable in the long term.

While Yellow-footed Rock-wallaby surveys were not carried out in the Flinders and Olary regions this year, anecdotal reports continue to indicate their recovery, with records of animals moving out into former haunts across the Flinders and Olary Ranges.

Pest plant and animal management



MIMOSA BUSH

Control works continued as part of a five-year agreement between S Kidman & Co and Natural Resources SA Arid Lands to undertake control work in the Innamincka Regional Reserve. Over 2300 Mimosa Bush (*Acacia farnesiana*) plants were treated at Policeman's Dam and Candradecka Dam. Follow-up work will continue at both properties, as well as further control work downstream of drainage lines emanating from these locations.

The Marla-Oodnadatta NRM Group completed its project which brought together seven properties to prevent Mimosa Bush spread in the Peake Creek and lower Neales River catchment.

Four properties were prioritised for control. Traditional herbicide control was undertaken on two stations; a third is trialling control methods in priority areas; and a fourth has installed vegetation filters for monitoring purposes and to protect neighbouring properties. The Group is awaiting significant rainfall to determine the effectiveness of treatments.

Marla-Oodnadatta NRM Group, SAAL NRM Board, Natural Resources SA Arid Lands, S Kidman & Co, Australian Government

PEPPER TREES

A long-term project to eradicate Pepper Trees from a North Flinders property continued with assistance for removal and controlling regrowth. Support was also provided to the Beltana Progress Association (p. 13), two properties in the North East Pastoral and Gawler Ranges districts.

SAAL NRM Board, Natural Resources SA Arid Lands, Australian Government

NOOGOORA BURR

Follow-up work was undertaken to treat an infestation of Noogoora Burr plants in the northern section of Innamincka Regional Reserve, and the Olary Weed Management Group were provided with assistance (see p. 14).

SAAL NRM Board, Natural Resources SA Arid Lands, Australian Government



BUFFEL GRASS

Buffel Grass control of outlier populations was continued in Innamincka Regional Reserve where it presents a major fire risk if allowed to get out of control.

With roadsides the main pathway by which Buffel Grass is spreading in the SA Arid Lands region, an annual management program continued on roadsides. A roadside detection survey was also undertaken to fill the knowledge gaps regarding Buffel Grass distribution in the region.

The SA Buffel Grass Strategy was released which outlines a statewide approach for managing this significant threat to our native pastures and communities.

Buffel Grass control also continued in the Kingoonya district through the Buffel Grass Action Group, Roxby Downs-based Buffel Busters, on Bon Bon Station (see p. 7) and at Umoona (see p. 35).

One property in the North Flinders was assisted to control an infestation through burning for later spraying.

SAAL NRM Board, Natural Resources SA Arid Lands, Native Vegetation Council, Kingoonya NRM Group, Department of Planning, Transport and Infrastructure, Bush Heritage Australia, Australian Government

OTHER WEEDS

One Gawler Ranges property was assisted to treat a small infestation of Onion Weed and a North Flinders property was assisted with African Rue control.

SAAL NRM Board, Australian Government

African Boxthorn removal



Feral camels

WEEDS OF NATIONAL SIGNIFICANCE

Weeds of National Significance (WoNS) are high impact, established weeds which are causing major economic, environmental or social impacts in several Australian states and territories, and have a strong potential for spreading. Seven of the 32 WoNS occur in the SA Arid Lands region and several activities were undertaken this year to contain their spread.

BONESEED

Follow-up control of Boneseed seedlings were removed from behind the Angorichina Village in November 2012. Inspection and removal of Boneseed seedlings has been occurring at the site for several years with the goal of eradication. All seedlings were found within 400 metres of the original 2002 collection.

ATHEL PINE

Watercourses on a lower Marree-Innaminka district property were inspected in May for Athel Pine. One of the worst Athel Pine infestations in SA, several hundred plants were removed from creeklines at the site in 2009. Over 450 trees and saplings were treated this year. Athel Pine control also commenced on the adjoining Lake Frome Regional Reserve downstream from previously controlled areas where about 250 plants were treated along the Poontana Creek.

AFRICAN BOXTHORN

African Boxthorn control was undertaken through the Olary Weed Management Group (see p. 14) and work commenced to remove a large population of several hundred trees in a floodplain on a property in the Gawler Ranges district.

PRICKLY ACACIA

The only known location of Prickly Acacia (*Acacia nilotica*) in SA was controlled on a Marree-Innaminka property in June. The localised population which occurred on the banks of a dam was removed through mechanical means to prevent spread.

PARKINSONIA

A survey of a North Flinders property revealed a small, isolated population of Parkinsonia in a minor creekline. Four plants were removed to prevent downstream spread as part of a wider strategy to eradicate this species from the region.

OPUNTIOID CACTI

Fifteen pastoral properties across the North Flinders, Gawler and North East Pastoral properties were assisted to treat Opuntoid cacti including Wheel Cactus, Prickly Pear, Rope Cactus and *Opuntia engelmannii*. While the Blinman-Parachilna Pest Plant Control Group and Arkaroola Wilderness Sanctuary were supported to continue their work on Wheel Cactus removal (see p. 30), other ongoing work focussed on properties with outlier populations of cactus to prevent further spread. A core infestation and outlier plants of Wheel Cactus near Oraparinna in Flinders Ranges National Park was also treated as part of *Bounceback* (see p. 9).

SAAL NRM Board, Natural Resources SA Arid Lands, Biosecurity SA, Australian Government

PEST MANAGEMENT AND RANGELANDS REHAB

The Pest Management and Rangelands Rehabilitation (PMRR) program finished up in June with a total of 66 properties funded to undertake 84 pest plant and animal control or soil rehabilitation projects. Many of the activities showcased in these pages were funded through this program.

Since the project began in 2009 a wide variety of land managers have sought assistance through the incentives-based program including pastoralists, Aboriginal communities and Progress Associations.

SAAL NRM Board, Natural Resources SA Arid Lands, Australian Government

CAMELS

Over 2500 camels were removed from the SA Arid Lands region this year. Removal efforts occurred in the Simpson Desert Regional Reserve, Kati Thanda-Lake Eyre National Park, Witjira National Park and on four pastoral leases. Over half of the camels were removed on Cowarie Station after the land manager reported a large and unexpected congregation of camels on the property. The removal program, which also occurred in the Far West of SA and Nullarbor, also occurred in response to land manager reports of emaciated camels gathering along the Dog Fence with their removal reducing the risk of damage and breaches to the Fence. Eighty-seven feral horses and 249 feral donkeys were also removed across the region.

Biosecurity SA, Ninti One Ltd, Natural Resources SA Arid Lands, Australian Feral Camel Management Project, Australian Government

Pest plant and animal management

PIGS

Feral pig control was undertaken in November 2012 on both the Cooper and Diamantina catchments in SA and Qld. In SA, over 200 pigs were removed from the Innamincka Regional Reserve, Coongie Lakes and pastoral leases in the Cooper Creek and Diamantina/Warburton systems. In total over 20,000 pigs were removed from SA and Qld combined, with the majority removed from Qld in the upper catchment areas.

Movement-activated cameras have been installed on the Innamincka Regional Reserve to identify feral pig locations and numbers and to monitor for changes in the pig population to inform when a control program is required. Innamincka Regional Reserve and the Coongie Lakes National Park are internationally significant wetlands, and are recognised as important water-bird breeding grounds by the Ramsar convention.

In conjunction with eight Marree-Innamincka district land managers, a feral pig management plan was completed to maintain low numbers of feral pigs currently present in the Cooper Creek and Diamantina/Warburton systems.

Meanwhile, three land managers from the North East Pastoral district and two from the Marree-Innamincka district undertook opportunistic removal after pigs had entered SA from interstate following the rains. Assistance and advice was provided to land managers on their baiting, trapping and shooting efforts.

SAAL NRM Board, *Desert Channels Qld, S Kidman & Co, Australian Government*



CATS

Cats were removed from Flinders Ranges National Park through the *Bounceback* program (see p. 9); while improved control measures were put in place at Boolcoomatta (see p. 7). Arkaba Station was also assisted to purchase cat traps for Yellow-footed Rock-wallaby preservation.

SAAL NRM Board, *Natural Resources SA Arid Lands, Australian Government*

FOXES

A coordinated fox baiting program was run through *Bounceback* across public reserves and neighbouring properties in the North Flinders, Gawler Ranges and North East Pastoral districts (see p. 9). Fox control was also carried out on Boolcoomatta Station (see p. 7).

Natural Resources SA Arid Lands, Bush Heritage Australia

GOATS

A coordinated goat control program was run throughout the *Bounceback* target area in the North Flinders, Gawler Ranges and North East Pastoral districts (see p. 9).

SAAL NRM Board, *Natural Resources SA Arid Lands, Australian Government*

RABBITS

Nearly 14,500 rabbit warrens were destroyed in the SA Arid Lands region across seven properties in the North Flinders, North East Pastoral and Marree-Innamincka districts, and also through Bush Heritage's work on Boolcoomatta Station (see p. 7). An additional 6 properties were assisted with other rabbit control methods including baiting, trapping and fumigation. This included work by the Friends of the Simpson Desert on Witjira National Park (see p. 32).

Work continued monitoring long-term vegetation recovery of perennial plant and native pastures as a result of rabbit control and calicivirus on Flinders Ranges National Park and on two North East Pastoral properties. Areas where the effects of calicivirus control have been maintained through warren destruction programs show continuing recruitment of perennials and a good mix of native pasture species, both on Park and in well-managed livestock pastures.

Bounceback (see p. 9) undertook a 1080 rabbit baiting trial in a section of Flinders Ranges National Park where rabbit warrens had been ripped about 10 years ago. The trial is testing the effectiveness of 1080 in reducing rabbit numbers and removing rabbits that might have become resistant to calicivirus.

SAAL NRM Board, *Natural Resources SA Arid Lands, Biosecurity SA, Australian Government*

GET INVOLVED

If you have pest plant and animal problems on your property and would like assistance contact Natural Resources SA Arid Lands 8648 5300



Land management

Mitchell Grass

LAND MANAGER SURVEYS

Forty land managers from across the SA Arid Lands region participated in in-depth interviews in October 2012 to establish their level of skills, knowledge and participation in natural resource management.

Participating land managers were randomly selected from each of the six NRM districts and across the full range of all pastoral tenures (ie. industry owned, family-owned, NGO-owned, and Aboriginal-owned) and the full range of pastoral uses (ie. sheep, cattle, combined sheep and cattle, and no stock.)

The results provide important baseline information for the SAAL NRM Board to show how it is tracking in meeting the targets in the *SAAL Regional NRM Plan* and highlights opportunities for improving NRM programs and services and the preferred method of engaging with land managers. The interviews will be repeated every five years.

Thank you to the participating land managers.

SAAL NRM Board, *Natural Resources SA Arid Lands, Ehrenberg-Bass Institute (University of South Australia), Australian Government*

PROGRESS ASSOCIATIONS

Four Progress Associations received small grants to assist with their local weed control efforts. Beltana Progress Association removed Pepper Trees from a creekline; Iron Knob Progress Association treated a small but growing infestation of cactus around the town; Andamooka Progress Association was supplied with herbicide for the treatment of cactus; and Yunta Progress Association was assisted with the treatment of an ongoing Onion Weed problem and the purchase of a spray unit.

SAAL NRM Board, *Natural Resources SA Arid Lands, Australian Government*

PROPERTY INFORMATION PACKS

A booklet and poster providing information on rare or significant plants and animals was developed for Evelyn Downs, Billa Kalina/ Miller's Creek and Todmorden Stations in the Marla-Oodnadatta and Kingoonya districts.

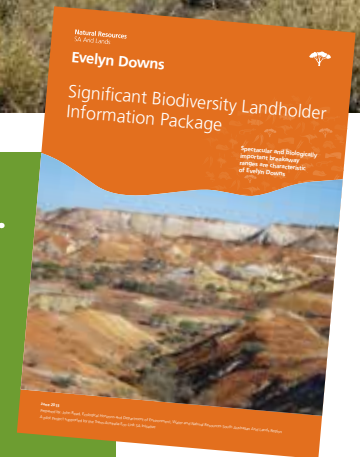
Developed in conjunction with land managers and combining their local knowledge with scientific data, the information packs describe each property's land systems along with the plant, bird, mammal and reptile species of conservation interest that are linked to those systems. General information on species distribution and habitat requirements is also provided.

They also consider the extent to which different land systems are grazed on each property and the extent that each land system is protected (eg in reserves) or unprotected elsewhere in the region.

The information has been developed to assist land managers in making management decisions, inspire surveys and to prioritise areas for potential stewardship opportunities.

The data utilised the records of the SA Museum, the State Herbarium of SA, DEWNR's Biological Database of SA, local knowledge, and other sources.

Natural Resources SA Arid Lands, Trans-Australia Eco-link, Ecological Horizons



GET INVOLVED

Funding exists to assist land managers in the Gawler Ranges and Kingoonya NRM districts to develop property information packs for their properties. Contact Natural Resources SA Arid Lands 8648 5300 for further information

PRESCRIBED BURN AT INNAMINCKA

A prescribed burn – the first ever – was carried out at Innamincka in September 2012 to reduce the risk of fire from a high fuel load caused by the previous two years' good rains.

The burn provided an opportunity to train local Geodynamics staff in fire management. The accreditation of these staff in fire fighting provides an important resource for the region in the event of a bushfire.

Unfortunately the wind dropped out just as the fire was lit; although only about 30 per cent of the 17 hectares was burnt, this still provided an additional fire break for the town.

Natural Resources SA Arid Lands, Innamincka Progress Association, Innamincka Station, CFS, Geodynamics



KAREN ENGLISH

PUBLIC ACCESS ROUTE CLOSURES

The K1 Warburton Crossing and the Walkers Crossing Public Access Routes (PARs) remained closed throughout 2012-13 due to almost continual flooding of the Diamantina and Cooper Creeks and localised flooding. However, conditions had dried out enough to allow repairs and restoration to both these routes in early 2013. Both routes are closed annually for the summer season from 1 December until 15 March in line with the closing of Witjira National Park and Simpson Desert Regional Reserve.

Public Access Routes are a network of unimproved and unsurfaced station tracks that provide public access to points of interest in pastoral SA. Their condition can change rapidly with the weather.

Pastoral Board, Natural Resources SA Arid Lands

PASTORAL BOARD HOLDS OPEN FORUMS

The Pastoral Board met at two open forums this year – one in Coober Pedy in April and one in Marree in June – meeting with 17 people representing 12 pastoral leases from the surrounding districts.

Presiding Member Geoff Mills welcomed the land managers and Board members before providing an overview of the Board's strategic priorities, water point development guidelines, Indigenous Land Use Agreements, and the Board's statutory obligation to ensure Crown land is managed in a way that is both conducive to the economic viability and long-term sustainability of the pastoral industry. An update was also provided on the Pastoral Board's Lease Assessment and Inspection Programs (see this page).

Other discussion points included the impact of mining activities on water supplies; the importance of working proactively with mining companies and the Department of Manufacturing, Industry, Trade, Resources and Energy in the early stages of mining development on a pastoral lease; the opportunities available through the Australian Government's Carbon Farming Initiative (see p. 33); and wild dog baiting and the importance of coordinating with neighbouring properties (see p. 17).

Pastoral Board, Natural Resources SA Arid Lands

MONITORING PASTORAL LAND CONDITION

Pastoral Lease Assessments were completed in the Eastern Districts (north of Morgan, in the SA Murray-Darling Basin region) and field trips commenced in the North Flinders district with 48 properties to be completed there.

This second round of Pastoral Lease Assessments commenced in 2005. The program is carried out on a 14-year cycle that allows for ongoing lease extension based on an assessment of land condition both at a property and district level.

Pastoral leases are also inspected for compliance with lease conditions every 2-5 years and to effectively monitor and address any current land management issues on individual leases.

This year, 25 pastoral inspections (encompassing 32 individual pastoral leases) were conducted and apart from two areas there were generally no significant environmental issues that required immediate attention. However this 12 month period has seen a return to dry conditions after two and a half above average rainfall years. The Oodnadatta and northern Birdsville Track areas are experiencing the worst of these drying conditions

Pastoral Board, Natural Resources SA Arid Lands

GET INVOLVED

For assistance with natural resource management projects and funding applications and aligning them with the SAAL Regional NRM Plan contact Natural Resources SA Arid Lands 8648 5300

OLARY WEED MANAGEMENT GROUP

Members of the Olary Weed Management Group were provided with herbicides to treat weeds. This group of 12 local land managers have been managing weeds at a landscape-scale targeting priority weeds including African Boxthorn and Noogoora Burr. This year the group purchased a spray unit and targeted two main sections of the Olary and Wiawera Creeks removing approximately 3000 African Boxthorn plants.

State Community NRM Grant, Natural Resources SA Arid Lands, SAAL NRM Board, Australian Government

GET INVOLVED

The Pastoral Board takes the opportunity to meet in the SA Arid Lands region at least once every year. Look out for information on the 2014 meetings or contact Natural Resources SA Arid Lands 8648 5300



Soil conservation workshop



Soil conservation workshop

KANGAROO SURVEYS

The annual aerial kangaroo survey took place in June and July 2013, with trained observers flying east/west transects counting Red Kangaroos and Western Grey Kangaroos. The survey also recorded the presence of Euros, emus, goats and other large species of interest such as camels and donkeys.

The Red Kangaroo population across the entire commercial harvest area was estimated to have increased by 16.2 per cent from the previous year, while the Western Grey Kangaroo population increased by an estimated 32.7 per cent.

The population estimates in 2013 were the highest recorded in 10 years. Rainfall in some northern harvest sub-regions

was below average over the last 12 months, which might explain the lower Red Kangaroo densities in those areas compared to 2012.

Land managers in the SA Arid Lands region have the option to manage the kangaroo component of the total grazing pressure on their properties through commercial harvesting permits.

Natural Resources SA Arid Lands

GET INVOLVED

For more information about the sustainable harvest of kangaroos contact Natural Resources SA Arid Lands 8648 5300

DIVERSIFICATION CASE STUDIES

Rawnsley Park, Willow Springs and Wirrealpa Stations in the North Flinders district are the focus of three new case studies profiling business diversification in the rangelands.

Developed in conjunction with the land managers, the case studies tell how these operating sheep and/or cattle stations have adapted to changing circumstances and value-added to their business through expanding their tourism ventures or adopting new land management approaches.

The case studies explain how and why each business has changed and grown over the years and reveal the benefits – production, environmental, financial, and social – that the land managers are experiencing by ‘spreading the risk’ and diversifying their businesses across several enterprises.

The land managers reveal some of the lessons that they have learned running complementary livestock and tourism enterprises while an in-line video sees Brendan Reynolds, Warren Fargher and Tony Smith talk about the changes they’ve made to their properties in their own words.

Land managers keen to learn more about the Ecosystem Management Understanding (EMU)TM approach will find the Willow Springs and Wirrealpa case studies particularly interesting.

Thanks to the land managers for sharing their stories.

SAAL NRM Board, *Rural Directions Pty Ltd, Bestprac, Natural Resources SA Arid Lands, Australian Government*

Download the case studies

Download the case studies at www.bestprac.info or www.naturalresources.sa.gov.au/aridlands

SOIL REHABILITATION & CONSERVATION WORKSHOP

Ten land managers attended a soil conservation workshop on Wintinna Station in the Marla-Oodnadatta district in April. The workshop focussed on rehabilitating a section of the old Stuart Highway and offered participants skid steer, dozer, loader and grader training.

Participants learned how road construction can impact pastoral productivity and landscape function and saw first-hand how following appropriate road maintenance practices can slow and spread overland water flow.

These five-day workshops allow participants to gain nationally accredited machinery tickets while learning about and carrying out on-ground soil conservation works. They build on on-ground works conducted as part of the Ecosystem Management Understanding (EMU)TM process (see article above).

Centralian Land Management Association, SAAL NRM Board, Natural Resources SA Arid Lands, Wintinna Station, Civil Train, Mark (Sharky) Frahn, Australian Government

ECOSYSTEM MANAGEMENT UNDERSTANDING (EMU)TM

The EMUTM process, an approach to land management and property planning which combines local knowledge of country with scientific expertise, was running on 17 properties across the region including pastoral leases, Aboriginal-managed land, and conservation reserves.

Wintinna Station hosted a soil conservation workshop in April (see article below) while Wirrealpa Station hosted a successful Landscape Literacy Course in June which focussed on upskilling Natural Resources SA Arid Lands staff in taking a catchment approach to landscape assessment.

Of the 17 properties, additional EMUTM support was provided to Wirrealpa, Martins Well, Willow Springs, Moonaree, Wintinna and Hamilton Stations and the Umoona Community. This included discussing future projects and assessing existing ones and establishing whole of property monitoring plans.

EMUTM information was presented at the Australian Rangelands Conference in Kununurra and regionally through a Bestprac Forum in Hawker (see p. 33) and Burra.

SAAL NRM Board, *Natural Resources SA Arid Lands, Trans-Australia EcoLink, Australian Government*

Wild dog management

North of Dog Fence

North of the Dog Fence in SA dingoes are neither specifically protected or declared but are acknowledged for the valuable ecological role they play in the environment. In this area they are only baited at times necessary to provide temporary protection to calves when alternative prey sources are low due to seasonal conditions.

BAITING APPLICATIONS

Despite declining seasonal conditions this year wild dog numbers have remained high and 1080 injection services or manufactured baits were supplied to 13 properties. A number of properties are organically accredited and unable to use 1080 baits for wild dog control; while 1080 is a natural product found in some Australian native plants, for commercial use the toxin is produced synthetically and its use is restricted on organically accredited properties. The issue is being investigated at a national level and alternative control measures for the rangelands are being researched.

SAAL NRM Board, *Natural Resources SA Arid Lands*

DOG FENCE MAINTENANCE

The Dog Fence Board continued its work maintaining the Dog Fence to prevent breaches by floods, fire or animal pressure. The Board met four times through the year and carried out their annual inspection of the Fence, this time inspecting the western half which stretches from the head of the bight to Roxby Downs.

Over 10,000 baits were laid regularly around waters in the 'buffer zone'; the buffer zone is an area which extends 35 kilometres north of the Fence which is baited to keep the area free of dingoes, thereby reducing high dingo numbers on the Fence. The Board reported that the Fence was in good order and dog proof.

The six local Dog Fence Boards were kept busy. Fifteen kilometres of foot netting was replaced on the Fence between the Eyre Highway and the coast; work continued on electrifying the top wire of the Fence at Mabel Creek to prevent damage from camels; 18 kilometres of mesh was attached to Parakylia fence, five kilometres replaced at Mundowdna, and six kilometres of fence at Muloorina was topped with mesh. Dog scarers were fitted to three grids at Balcanoona and Frome Downs and track maintenance was undertaken along the Penong and Pureba fences.

GET INVOLVED

If you would like to discuss wild dog control on your property contact Natural Resources SA Arid Lands
8648 5300



DINGO RESEARCH PROJECT

The Dingo Research Project is investigating the relationship between 1080 baiting, calf predation/lactation failure, and biodiversity on cattle stations north of the Dog Fence.

It has been operating on Cordillo, Quinyambie and Todmorden Stations since 2009 and on Innamincka Station since 2012. Stations maintain 1080 baited and unbaited paddocks to identify the proportion of calf loss; the environmental factors associated with calf predation; and the ability of wild dog baiting to protect against calf predation. Data collection continued this year with monitoring of activity (presence and movement) of wild dog and other prey and predators; analysis of wild dog diet; and monitoring of pregnancy-tested cows. Blood samples were also collected from cattle across all properties to determine the presence of disease that might also be responsible for calf loss.

Due for completion in 2014, the project will contribute to refining a wild dog management plan for improved cattle production and biodiversity outcomes. Consultation occurred with the Maree-Innamincka and Marla-Oodnadatta NRM Groups around how best to incorporate land manager knowledge into a draft plan.

SAAL NRM Board, *Natural Resources SA Arid Lands, Santos*

DINGO ROLE IN THREATENED SPECIES CONSERVATION

Arid Recovery entered the final phase of its Dingo Project – the removal of dingoes from the Dingo Pen, a 3000 hectare fenced enclosure within the Arid Recovery Reserve. Since 2008 the project has looked at the interaction of dingoes, cats and foxes, in the Australian rangelands.

In its initial stage a pair of dingoes was placed into the Dingo Pen. Seven foxes placed in the pen were found dead within 17 days and six feral cats all died within 123 days. 'Autopsies' indicated all the deaths could be attributed to dingoes.

If dingoes are found to suppress cat and fox numbers this could benefit threatened species like Greater Bilbies and Western Barred Bandicoots, both of which have been successfully reintroduced to the Reserve.

However, dingoes will also prey on native animals such as Spinifex Hopping Mouse. In 2012 funding was received through the University of NSW to continue the project for 12 months to investigate behavioural patterns of dingoes and small mammals. The results will be available in 2014.

Arid Recovery, Zoos SA, University of Adelaide, Natural Resources SA Arid Lands, BHP Billiton, University of New South Wales

Wild dog management

South of Dog Fence

PETER LANGDON

This year a total of 96,970 individual baits were distributed through ground and aerial baiting. One hundred per cent of land managers in the Kingoonya district participated in some form of wild dog control (aerial baiting, ground baiting, or both) followed by North Flinders (80%), North East Pastoral (63%) and Gawler Ranges (46%). Participation rates per land tenure were tourism (100%), mining (86%), National Parks (75%), primary producers (71%), conservation groups (63%) and Aboriginal-managed land (60%). Records show a decline in the number of properties participating in ground baiting while aerial baiting participants steadily increase. To maximise effectiveness of control it is important that aerial baiting is used as an 'additional' tool to access inaccessible country and that it is used in conjunction with ground baiting.

BITEBACK

The *Biteback* program for wild dog control received a further three years funding in October 2012 providing land managers with renewed assistance for conducting wild dog control on their properties. This year, *Biteback* focussed on the Kingoonya and Gawler Ranges districts where land manager participation rates were raised

by 18 per cent and 4 per cent respectively through one-on-one visits to non-participating properties.

The program also improved its linkages with the Pastoral Board, with staff acting on a Gawler Ranges NRM Group initiative to include maps showing wild dog movement, stock loss, and baiting with their annual stock returns. Prior to this pastoralists provided maps only twice per year at the bi-annual baiting service.

Twenty-one injection services were delivered from October-December 2012 and again in March-May 2013 – eight in the North Flinders, four in Kingoonya, four in Gawler Ranges, and five in the North East Pastoral district.

SAAL NRM Board, *Natural Resources SA Arid Lands, Regional (land-based) NRM levy, Sheep Industry Fund, Australian Wool Innovation*

WILD DOG INCENTIVE SCHEME

A funding proposal was developed by North Flinders and Marree district land managers to obtain assistance to remove wild dogs in their districts.

The proposed 12 month trial aimed to decrease sheep predation by wild dogs, increase sheep welfare and land manager wellbeing, support local community initiatives, educate land managers on varying best practice control tools, and to encourage more wild dog groups to undertake similar incentive schemes.

The proposal was developed after a workshop held at Beltana in March in conjunction with the North Flinders NRM Group meeting and attended by 13 land managers. The application for funding was rejected but the land managers have been pursuing other options.

North Flinders and Marree district land managers

South of the Dog Fence the dingo is a declared pest animal under *SA's Natural Resources Management Act 2004* where it presents a real threat to the sheep grazing industry.

AERIAL BAITING

An aerial baiting program saw 44,200 baits distributed over 88 properties in nine days in April-May, complementing *Biteback's* ground baiting efforts.

Now in its second year, the program targeted inaccessible areas along a 10,700 kilometre flight path across rugged parts of the Flinders and Olary Ranges and around the margins of Lakes Torrens, Gairdner and Everard.

Overseen by Biosecurity SA and coordinated by Flinders Ranges' land manager Bill McIntosh, the program was expanded to include an additional 18 properties. The hiring of a local aerial operator with enhanced GPS capabilities ensured that baits were accurately placed. It also obviated the need to carry navigators thereby increasing payloads, lengthening flight times and markedly improving efficiency.

Three workshops held in June to evaluate the program revealed widespread land manager support.

'Aerial baiting is the only way to bait rough hilly country, densely vegetated watercourses and lake edges' was one comment while another land manager said 'We need to continue aerial baiting at all costs to help eradicate dogs in inaccessible country.'

Biosecurity SA, Australian Wool Innovation, SA Sheep Industry Fund

THANK YOU

Thanks to the land managers from the North Flinders district and kangaroo processors Dew's Meats and VOR Management for the support they lent to the aerial baiting and ground baiting programs in the region



Bait preparation at the Abminga bait injection service in the North East Pastoral district

Our activities

This map identifies properties participating in activities during 2012-13 which contribute to SAAL *Regional NRM Plan* priorities; icon size is not representative of the area covered.

● Water projects

Activities focused on assessing or addressing management priorities for water quality, flora and fauna condition and key threats in aquatic ecosystems

● Aboriginal projects

Projects undertaken by Aboriginal communities on private land

● Integrated property management planning

Properties involved in whole-of-property planning, using an Ecosystem Management Understanding (EMU)TM approach

▲ Pest animal management

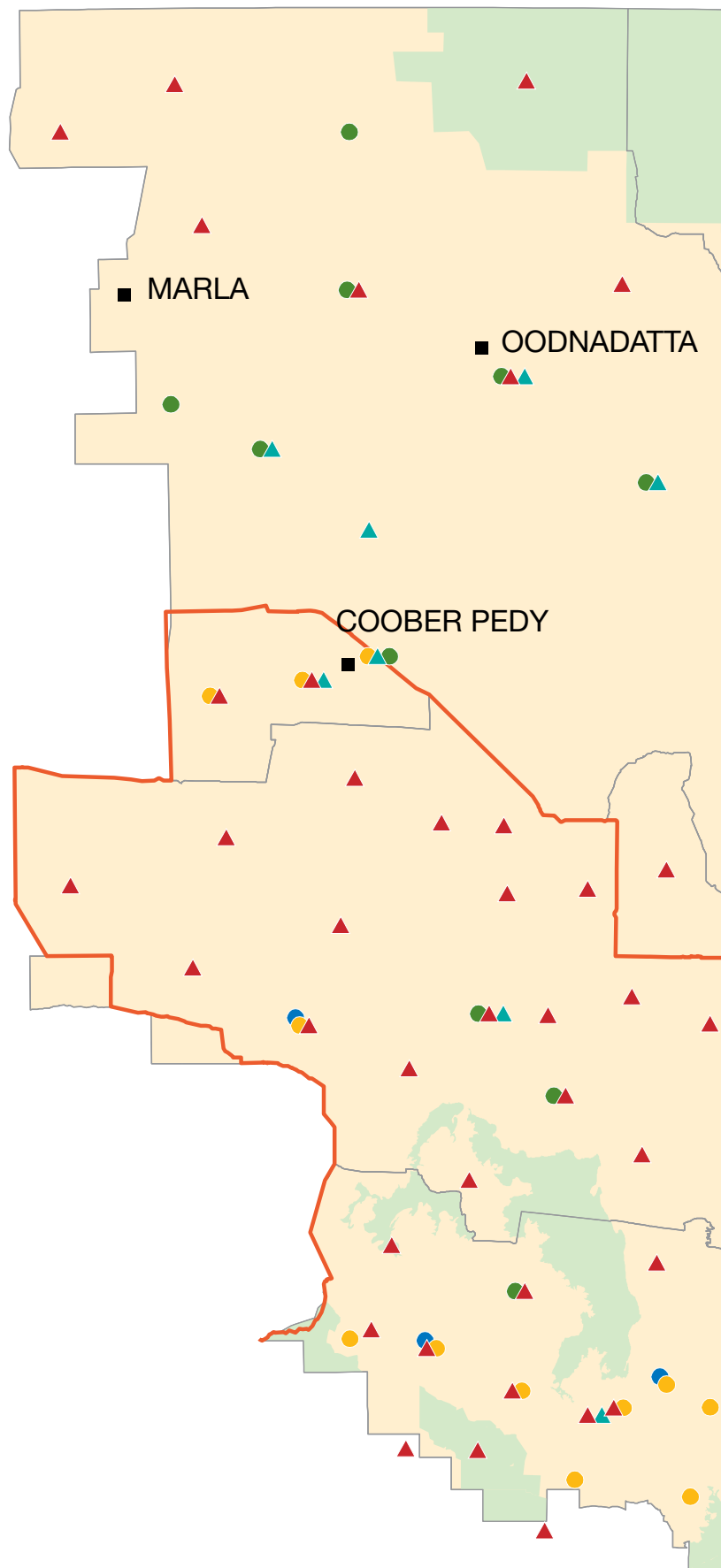
Properties and Parks involved in the control of pest animals, including dingoes/wild dogs, cats, donkeys, foxes, goats, horses, camels, pigs and rabbits

▲ Pest plant management

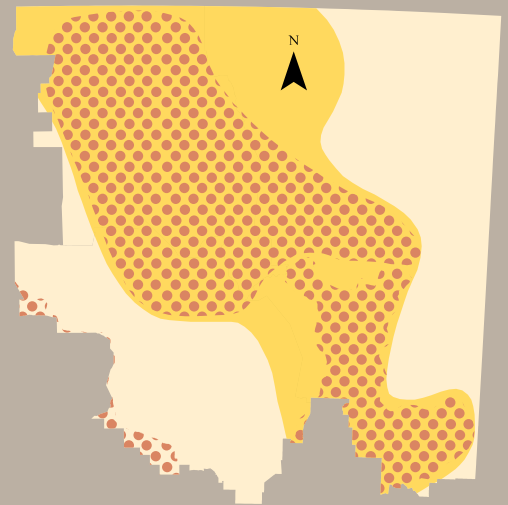
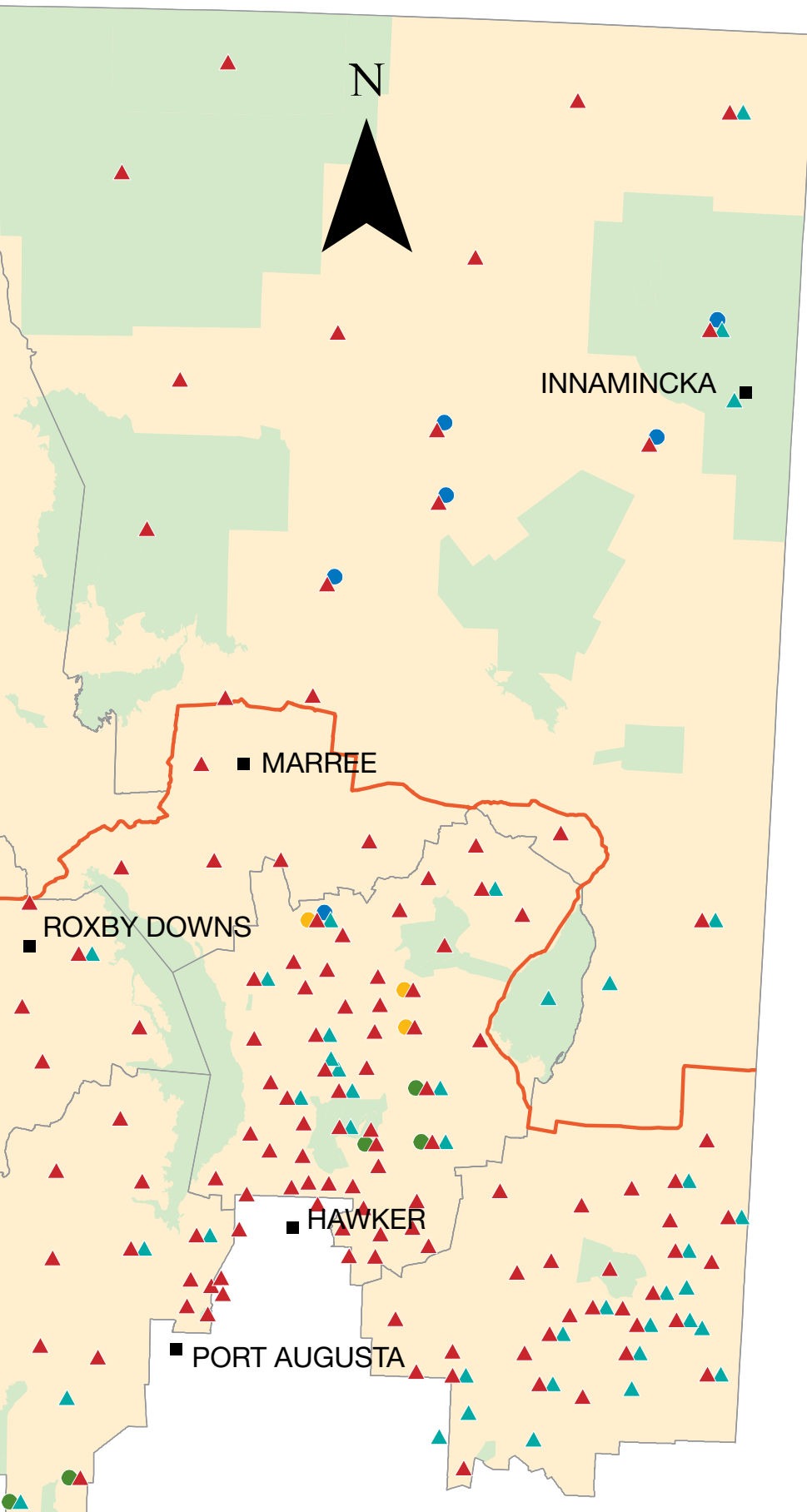
Properties and Parks involved in the control of pest plants, including African Rue, Athel Pine, Boneseed, African Boxthorn, Buffel Grass, Prickly Acacia, Parkinsonia, Mimosa Bush, Noogoora Burr, Onion Weed, Cactus, Pepper Tree

■ National Parks and Reserves

— The Dog Fence



WILDLIFE CORRIDORS IN THE SA ARID LANDS REGION



-  Naturelinks
-  Trans-Australia EcoLink
-  Arid Lands Region

The map, above, shows the location of four wildlife corridors in the SA Arid Lands region. Three of these are part of NatureLinks; Flinders-Olary in the south-east, East meets West in the south-west and Arid Lands in the north. The fourth is the Trans-Australia Eco-Link which overlaps and expands on NatureLinks and extends north into the NT.

NatureLinks

Adopted in 2002 in response to ongoing biodiversity loss and the emerging threat of climate change, NatureLinks recognises the importance of ecological connectivity at the continental and regional scales. It focuses on the development of collaborative partnerships between those running conservation programs and those who can help to achieve landscape-scale biodiversity conservation.

Trans-Australia Eco-Link

Established in 2010, the Trans-Australia Eco-Link (TAE) stretches south from Arnhem Land in the NT through to Port Augusta in SA. TAE aims to connect conservation efforts across public and private land, focusing on developing economic diversification options for land managers.

Our water

PAUL WAINWRIGHT

9 management or rehabilitation activities implemented in priority aquatic ecosystems

2 bores decommissioned, **1** bore re-drilled and **2** bores rehabilitated with annual water savings of **24,920** megalitres equivalent to **27** Olympic sized swimming pools per day

24 enquiries into Water Affecting Activity permits, and **2** applications

In the SA Arid Lands region water is the magnet that attracts people, biodiversity and industry. It is the key resource in an arid environment. For a region where rainfall is so low, there is an amazing ability to support a huge diversity of life through a phenomenon known as 'boom and bust'.

North of the Dog Fence the region is dominated by four major catchments – Neales-Peake, Cooper Creek, Georgina-Diamantina, and Macumba – large surface draining networks which terminate at Lake Eyre. 'Boom' periods are triggered when floodwaters from interstate and major regional rainfall events enter the catchments and recharge the region's lakes, dams and wetlands including the Ramsar-listed Coongie Lakes.

Plants regenerate and waterbirds and fish use the opportunity to breed in large numbers attracting thousands of visitors wishing to experience this unique phenomenon.

During frequent and prolonged dry or 'bust' periods, waterbodies with permanent fresh water such as Algebuckina Waterhole in the Neales River catchment and Cullyamurra Waterhole in the Cooper Creek catchment provide critical refuge for plants and animals.

Underlying the Lake Eyre Basin is the Great Artesian Basin (GAB), one of the largest groundwater basins in the world. The GAB is characterised by groundwater-fed springs which support unique aquatic life forms. Dalhousie Springs, a popular tourist destination, is one of the best examples of a GAB spring complex in Australia which supports a number of endemic aquatic species.

In the southern region, including the Gawler Ranges and North Flinders, the rainfall is low and the catchments are generally small. Surface water flows are generated on hilly-rocky headwaters and the majority is rapidly lost as the flows pass onto the plains or into shallow terminal lakes where it is lost through evaporation. Rain-fed rockholes and groundwater-fed springs are important cultural and ecological features in these landscapes.

[The water resources of the SA Arid Lands region are, to a large extent, unmodified and in good condition.](#)

However, there is a threat from pest species and the tourism sector, and pressure from the mining industry for water requirements.

In such an unpredictable climate with high variability from year to year, and with so much life dependent on a healthy water supply, careful management of water in the region is critical.

10 YEAR RESOURCE CONDITION TARGETS

3. Improve or maintain the extent and condition of at least 50% of priority aquatic ecosystems

7. Improve or maintain the average quality and pressure of groundwater

8. Improve or maintain flow regimes and water quality in surface water systems

WATER AFFECTING ACTIVITIES

Natural Resources SA Arid Lands staff managed 24 enquiries regarding Water Affecting Activities this year from properties managed for pastoral, mining and conservation purposes, existing permit holders, and exploration companies.

Water Affecting Activities permits were introduced in 2010 to help manage the impacts of certain activities on the region's water resources and ecologically sensitive areas.

This means land managers planning to undertake activities in the SA Arid Lands region that may impact on a water resource may need to apply for a permit. Designed to secure a sustainable water supply and natural habitat for future generations, a Water Affecting Activities permit is required for any work

undertaken by an individual or organisation that may adversely affect the health of natural watercourses, springs, waterholes, floodplains and dependent ecosystems in the SA Arid Lands region.

The intent of this regulation is not to stop or slow down development within the region or to control land managers' decisions. It is to work with land managers through the permit process, trying wherever possible to achieve a win-win result where Water Affecting Activities can be accommodated with some measures in place to protect the region's environmental assets.

Through the permit process, the SAAL NRM Board have oversight of the Water Affecting Activities that are taking place in the region and can assess and approve future infrastructure

developments against potential environmental impacts and the long-term sustainability of the region.

There is considerable regional expansion occurring from the mining boom. Combined with the important contribution of pastoralists to our economy, the extra activity in the region creates new challenges to manage the sustainability of water resources upon which our plants and animals, communities and industries depend. The Board is encouraging voluntary compliance to the Water Affecting Activities regulations but failure to comply can attract penalties.

SAAL NRM Board, *Natural Resources SA Arid Lands, NRM water levy*

**YOUR
NRM Levy
at work**

Tirrawarra Waterhole, Innamincka Regional Reserve



PERMIT?

Do you want to construct or enlarge a dam, levee bank or water crossing point? Excavate or modify a natural watercourse? Construct a bridge or road? These are just a few examples of Water Affecting Activities that may need a permit so we can assess the impact of these developments on the health and condition of water resources, on other water users, and on the ecosystems that depend on our water resources.

To find out more contact Natural Resources SA Arid Lands 8648 5300

UNDERSTANDING COAL SEAM GAS IMPACTS

Information about water resources that may be affected by potential coal seam gas or large coal mining developments has been gathered from 30 properties located in the Arckaringa and Pedirka Basins (see map) since September 2012.

The information is improving our scientific understanding of the surface and groundwater resources associated with these coal bearing basins so we can better assess the likely water-related impacts of future coal seam gas or coal mining operations in the SA Arid Lands region.

These investigations have better defined the basins' hydrogeological features – including their geometry and extent, and the depth from the surface to different geological strata – and improved our understanding of groundwater movement.

From March to June, an audit was commenced of accessible water wells in the two basins to collect site information, bore condition and basic groundwater information. This information is being added to SA's well database, Groundwater Data. It will assist in creating information such as potentiometric surface maps and in assessing the vulnerability of groundwater resources to development impacts.

The information from the SA Arid Lands will contribute to a single spatial database which consistently defines the State's water assets and identifies their

environmental, cultural and economic values.

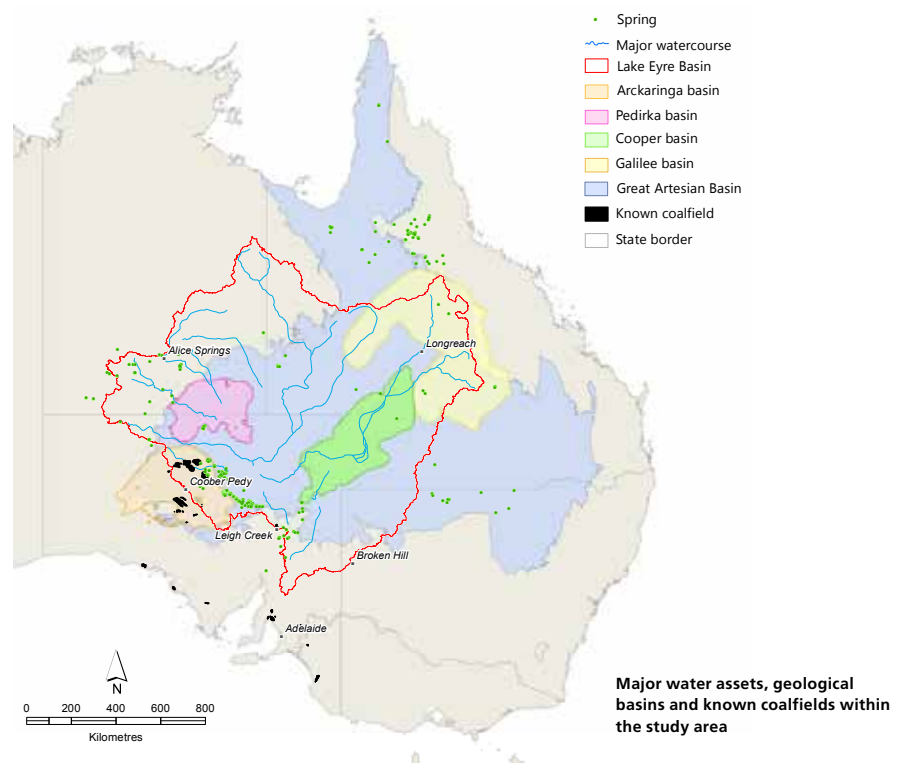
It will also be used to develop a risk and vulnerability assessment framework to support the future assessment of coal seam gas and coal mining developments.

This framework will also consider community value of water resources.

This work is part of the National Partnership Agreement on Coal Seam Gas and Large Coal Mining

Development, established by the Australian Government in November 2011 to strengthen the regulation of coal seam gas and large coal mining developments that may have significant impacts on water resources.

Department of Environment, Water and Natural Resources, SAAL NRM Board, and numerous other SA and interstate government departments, NRM bodies, research organisations and private consultants, Australian Government



WHAT IS COAL SEAM GAS?

Coal seam gas (CSG) is the name given to naturally occurring gas trapped in underground coal seams by water and ground pressure.

Coal seams store both gas and water. The water is under pressure from the weight of overlying rock material, holding the gas in place, and when the water pressure is reduced the gas is released.

The extraction process (production) involves the drilling of a well into a coal seam and the water being gradually pumped out of the seam, which reduces the pressure and allows the gas to flow through the well to the surface.

There are vast CSG resources spread across Australia's many coal basins,

particularly in the Bowen and Surat Basins in Qld and NSW. It has been commercially produced in Qld for more than 15 years and generates about 17 per cent of Qld's electricity needs.

WHEN IS MINING LIKELY TO START?

This fieldwork does not signal the beginning of CSG or coal mining development in SA. It is about understanding, through scientific research, the potential impacts of CSG and coal mining activities on water resources.

By doing this research now, impacts of any future developments can be assessed and avoided or mitigated with confidence and transparency.

ARCKARINGA BASIN

The Arckaringa Basin straddles the SA Arid Lands and Alinytjara Wilurara NRM regions with its centre near Coober Pedy. It covers an area of about 10,000,000 hectares.

PEDIRKA BASIN

The Pedirka Basin straddles the SA/NT border and is located to the north-east of the Arckaringa Basin. It is about 160 kilometres south-east of Alice Springs. It covers an area of about 6,000,000 hectares. There is less known about coal deposits in this basin, but the extent of potential coal occurrences has been estimated.

The Great Artesian Basin

Groundwater, particularly from the Great Artesian Basin, is critical to the health of ecological communities and the viability of the pastoral, mining and tourism industries in the region.

The Great Artesian Basin (GAB) is one of the largest groundwater basins in the world, underlying 22 per cent of the Australian continent.

Groundwater naturally discharges from the basin via diffuse upward leakage and spring discharge. Pumping and discharge from bores over the last 100 years has also added a significant level of discharge.

The springs provide oases for unique aquatic life forms and have been discharging GAB water for at least one million years during which the climate has changed dramatically around them.

These pages describe the work of a number of partners in gathering ecological and hydrological data which will improve our understanding of the resource and our ability to sustainably balance user requirements with those of the environment

Over time, this new information will be used by the SAAL NRM Board to refine the *Water Allocation Plan* for the *Far North Prescribed Wells Area* and refine Water Affecting Activities permit conditions (see p. 21).

This will become increasingly important in coming years as the demands on the Great Artesian Basin intensify due to the projected growth in mining, petroleum and geothermal industries in the region.

GREAT ARTESIAN BASIN WATER RESOURCE ASSESSMENT

The Great Artesian Basin Water Resource Assessment was launched at the GAB Researchers' Forum in Adelaide in March.

This two-and-a-half year, \$6.25 million project assessed water resources across the entire GAB to better understand its hydrogeology in light of recent extractive industry development across the basin.

The research will strengthen the science underpinning decisions about coal seam gas, coal mining and their impacts on the GAB water resources (see p. 22).

The key finding was that vertical groundwater movement is more important than previously thought and this will undoubtedly have management implications that guide decision-making by governments, industry and the community.

Download the reports

The Great Artesian Basin Water Resource Assessment technical reports, whole-of-GAB and regional reports are located on the CSIRO website, along with a 12-page summary document:

www.csiro.au/en/Organisation-Structure/Flagships/Water-for-a-Healthy-Country-Flagship/Sustainable-Yields-Projects/Great-Artesian-Basin-Assessment/Technical-Reports.aspx

CSIRO, Geoscience Australia, Australian Government



Dalhousie Springs



Great Artesian Basin
Western Margin

WATER ALLOCATION PLANNING... HAVE YOUR SAY

The SA Arid Lands Natural Resources Management Board is scheduled to undertake a review of the *Far North Prescribed Wells Area Water Allocation Plan*.

A Water Allocation Plan (or WAP) is a legal document that sets out the rules for managing, taking and using prescribed water. The SAAL NRM Board is responsible for working with the community to develop and review water allocation plans for the region.

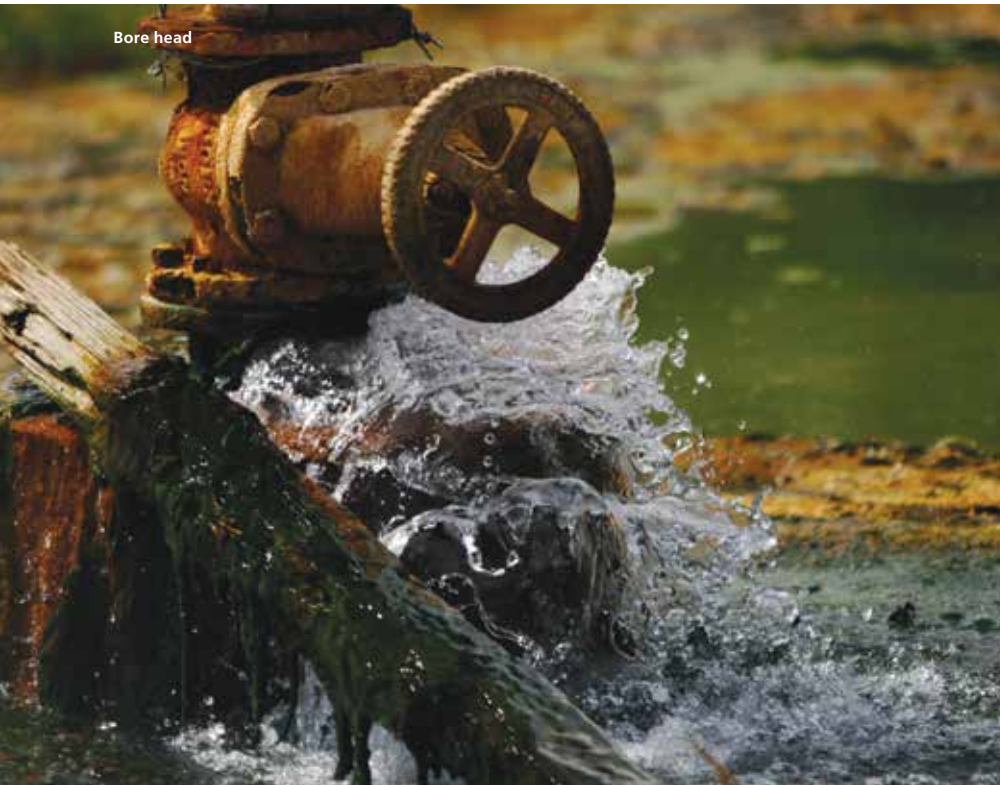
The only prescribed water resource in the SA Arid Lands region is the Far North Prescribed Wells Area which covers the Great Artesian Basin (GAB) and other groundwater aquifers.

The existing *Far North Prescribed Wells Area Water Allocation*

Plan was developed in response to concerns over the decreasing pressure in the GAB and it was recognised that there was a need to eliminate wasteful practices to ensure the future of the water resources for all water users.

There are currently no prescribed surface water resources within the region and the *SAAL Regional NRM Plan* sets out the activities that can be undertaken for any unprescribed water resources within the region.

Further information about the *Far North Prescribed Wells Area Water Allocation Plan* review and opportunities to have your say on water management issues and concerns will be featured in future editions of *Across the Outback*.



Groundwater

GAB MONITORING NETWORK

Work continued on a national project to establish a whole-of-Basin GAB Monitoring Network in SA, Qld, NSW and the NT.

Nationally, work is underway to modify the bores to allow manual or automated measurements of pressure, temperature, pH, electrical conductivity, and unrestricted flow over time.

In SA, bore modification has been completed at 34 sites with 15 sites in the network being instrumented with data loggers. Data was also collected from all of the GAB bores in SA while water resource monitoring instruments at Dalhousie Springs were upgraded to improve the quality of the data collected from ageing equipment at the site.

Established in 2008 under GABSI, the national GAB Monitoring Network comprises a total of 263 bores, including 42 in SA. It addresses whole-of-Basin water management issues, and ensures monitoring techniques and data collection are both comprehensive and consistent.

The information collected by the network will help water users understand the impacts of water extraction on the GAB; provide decision-makers with the tools to predict the impacts of new proposals for water allocation and keep impacts within acceptable limits; and help protect the plants, animals and people that depend on the natural discharge of GAB water.

It will also enable the impacts of the bore capping and piping program to be better monitored and inform future management of the GAB.

The network is due for completion by June 2014.

Department of Environment, Water and Natural Resources, GAB Coordinating Committee, Australian Government

GREAT ARTESIAN BASIN SUSTAINABILITY INITIATIVE

In the SA Arid Lands region this year two bores were decommissioned (Eitzens and Alberga), one redrilled (Goyder's Lagoon), and another two rehabilitated (Camel Creek and Muloorina-1) as part of the Great Artesian Basin Sustainability Initiative (GABSI).

GABSI is a national program aimed at reducing groundwater waste from the Great Artesian Basin.

Since the program first commenced in 1999, GABSI has been working with land managers to rehabilitate (cap) uncontrolled bores and replace wasteful earthen bore drains with pipes.

So far the program has saved 24,920 megalitres per year in SA. Since 1999, across the Great Artesian Basin, 1143 wells have been capped and more than 24,483 kilometres removed and replaced by 27,000 kilometres of piping.

This has resulted in returning 191,862 megalitres of water to the environment every year improving the health of important groundwater-dependent ecosystems associated with GAB springs, and ensuring continued access to artesian water by industry.

Next year work is expected to occur on the deep and technically challenging Poollowanna, Poonarunna (White Bull), Haddon Downs and Purni wells. Additional works including Toonketchen redrilling and decommissioning of Murnpeowie Station are also planned.

GABSI is currently funded to June 2014 and future funding is under consideration.

Department of Environment, Water and Natural Resources, GAB Consultative Committee, Australian Government



Blanche Cup mound spring

ALLOCATING AND MAINTAINING GREAT ARTESIAN BASIN WATER

The four-year, \$17 million research project Allocating Water and Maintaining Springs in the Great Artesian Basin (GAB) was completed this year and launched at the GAB Researchers' Forum in Adelaide in March.

Incorporated within seven volumes of research reports, the findings will be used to help future management of Great Artesian Basin groundwater.

The research provides the best scientific knowledge in more than 30 years advancing our understanding of the south-western margin of the GAB's water balance and pressure dynamics, and the interdependent relationship between aquifer pressure and the flow patterns of natural mound springs of the western GAB.

The primary GAB environmental assets are natural mound springs, many of which support unique species and ecosystems, and are reliant on aquifer pressure for flows to continue.

The project successfully mapped about 5000 spring vents (both flowing and extinct) in SA and extended knowledge of the high genetic diversity present in the GAB springs.

With the interdependent relationship between the hydrogeology of the underlying aquifers and the health of natural mound springs based on natural flow rates now better understood, it will be possible to put in place management practices that preserve these natural assets.

The comprehensive mapping of the springs included baseline measurements of vegetation growth around major spring groups.

Ongoing monitoring that measures any decline or increase in surrounding vegetated wetlands will provide an indicator of any change in flow rates from the natural spring vents.

Importantly, this monitoring will enable SA to identify potential impacts of Water Affecting Activities (see p. 21) and future developments in the region.

It also helps us to put in place effective mitigation strategies and adaptive management practices that will maintain healthy spring-dependent biological communities.

And it means that future groundwater extractions and development in the region can be more accurately targeted towards areas that do not support high value ecosystems or other groundwater dependent assets.

In short, the outcome will be improved sustainable water allocation planning.

SAAL NRM Board, Flinders University, Adelaide University, CSIRO, the SA Department of Environment, Water and Natural Resources, and the Northern Territory Department of Natural Resources and Environment, Australian Government

Key findings

- The overall recharge and inflow into the western GAB is less than assumed or estimated by previous studies and much of the inflow along the western margins occurred in a geological period more than 10,000 years ago under a very different climate than today
- The western GAB is in a state of natural, long-term pressure decline
- There is a large volume of water in storage in the western GAB and continuing inflows into SA from the eastern States that occur over long periods of time
- Diffuse leakage (water permeating slowly upwards where it is evaporated from the soil) is much less than is estimated in the current *Far North Prescribed Wells Area Water Allocation Plan* but vertical leakage via preferential flow paths is much greater than previously estimated
- Around 5000 spring vents (both flowing and extinct) have been mapped with elevations of the outflow points recorded
- High genetic diversity and a high degree of endemism is present in the GAB springs with 25 new species of invertebrates discovered that can be found nowhere else in the world.

DOWNLOAD THE REPORTS

The *Allocating Water and Maintaining Springs in the Great Artesian Basin* research is split between six volumes with a seventh volume which summarises the key findings.

1. Hydrogeological Framework of the Western Great Artesian Basin
2. Groundwater Recharge, Hydrodynamics and Hydrochemistry of the Western Great Artesian Basin
3. Groundwater Discharge of the Western Great Artesian Basin
4. Spatial Survey and Remote Sensing of Artesian Springs of the Western Great Artesian Basin

5. Groundwater-dependent Ecosystems of the Western Great Artesian Basin
6. Risk Assessment Process for Evaluating Water Use Impacts on Great Artesian Basin Springs
7. Summary of findings for natural resource management of the Western Great Artesian Basin

These reports can be downloaded here:

archive.nwc.gov.au/library/topic/groundwater/allocating-water-and-maintaining-springs-in-the-great-artesian-basin

Surface water

MANAGING THE COOPER CREEK

The 'Cooper Creek project' finished up this year investigating the natural features and human influences on key waterholes and wetlands along the Cooper Creek in the Marree-Innaminka district.

The Cooper Creek catchment is a significant wetland system which supports unique and important biodiversity and a range of industries including pastoralism, mining, and tourism.

Baseline information was gathered on hydrology, geomorphology, vegetation, birds/floristics, soils, ecological condition, cultural landscape values, and visitor management; investigations focussed on human activity and pest plant and animal impacts to inform future management strategies.

KEY FINDINGS

Cooper Creek has a highly variable natural flow regime and is an excellent example of a low gradient, intermittent, dryland river.

- The river's natural flow patterns are largely intact and characterised by the 'boom and bust' dynamics of its arid environment
- The catchment's waterholes provide vital habitat for a range of fish and other aquatic species including turtles, water rats, yabbies, shrimps and macro-invertebrates
- Hydrological assessment confirmed the importance of Cullyamurra Waterhole (in Innaminka Regional Reserve) as a critical refuge for aquatic species due to its ability to hold water and sustain life in extended dry periods
- At 26 metres, Cullyamurra Waterhole is the deepest waterhole recorded in the Lake Eyre Basin.

Maintaining natural flow regimes is critical for conservation of the Cooper Creek catchment's waterholes.

- Pests (eg Gambusia, goldfish and feral pigs), total grazing pressure, and infrastructure (eg bridges and roads) are key threats to natural biodiversity and flow regimes
- Impeding natural flow regimes can have detrimental impacts on nutrient transfer, dispersal and recruitment of plant and aquatic species
- Maintaining connectivity between river channel and floodplains is critical to vegetation and soil health
- Geomorphological assessment shows the system is vulnerable to Cane Toad invasion.

Cooper Creek is characterised by a steep gradient of decreasing flows and increasing salinity which impacts vegetation structure.

- In the upper reaches, around Innaminka and Coongie Lakes where annual flows are expected, the vegetation structure is well formed, complex and diverse and consists of River Red Gum, Bean Tree and Coolibah
- In the lower reaches, towards Kati Thanda-Lake Eyre where flows are infrequent and the area saline, the vegetation structure is sparse and only Coolibah is present at variable and low densities
- Ecological condition assessments revealed that riparian vegetation was in generally good condition following three years of flooding and extensive local rain events.

Cooper Creek wetlands have high ecological, aesthetic, cultural and recreational value; they are important as biological refuges and add to the capital value of grazing enterprises.



The Cooper Creek at Innaminka Common

DOWNLOAD THE REPORTS

A series of technical reports that describe the geomorphology, hydrology, aquatic ecology, ecological condition, vegetation and birds, and cultural landscapes associated with the Cooper Creek will be available from the Natural Resources SA Arid Lands website in early 2014: www.naturalresources.sa.gov.au/aridlands

SAAL NRM Board, *Natural Resources SA Arid Lands, SARDI, Australian National University, University of Melbourne, Wakelin Associates, Ausabout, Connections Now, Australian Government*

THANK YOU

Thank you to land managers for providing access to their properties during this project and to volunteers, Traditional Owners, Luise Hercus, and workshop participants

INTERPRETIVE SIGNAGE

Work is underway on signage for key waterholes and cultural sites within the Cooper Creek catchment to minimise visitor impacts and explain the cultural and ecological values of the system.

The signs are a response to the increasing numbers of visitors to heavily-used sites and will improve visitor understanding of how the catchment functions and supports native plants and animals.

At this stage, signs are planned at the Innaminka town common; Cullyamurra and Minkie Waterholes; Moomba; Embarka Waterhole; and the mission site at Lake Killalpaninna.

The work is being undertaken in consultation with the Dieri and Yandruwandha/Yawarrawarrka Aboriginal communities and land managers.



Kanyaka Creek, Kanyaka Gauge station

AQUATIC ECOSYSTEM HEALTH CHECK

An assessment of the health of major rivers and key permanent waterholes in the SA Arid Lands region revealed that 95 per cent are at least in 'fair' condition and, of these, 62 per cent were rated 'good' or 'very good'.

The assessments sampled 54 priority aquatic ecosystems on public and private lands in the Flinders region (including Balcanoona and Brachina Creeks) and the Lake Eyre Basin (including Algebuckina and Hookeys waterholes) in May and November 2012.

Information was collected on water quality, flora and fauna, shade cover, bank erosion and siltation as well as

assessing potential impacts from mining and tourism activities, feral animals, and weeds.

Most sites showed evidence of nutrient enrichment and some stock and/or feral goat disturbance. This warrants further investigation in the future.

With the work contributing to several targets in the *SAAL Regional NRM Plan*, the data provides a baseline against which future results can be measured; the intention is to repeat the field work every five years to highlight any changes in condition and to inform management priorities.

Thanks to land managers for providing access to their properties.

Environmental Protection Authority, SAAL NRM Board, Natural Resources SA Arid Lands

DOWNLOAD THE REPORTS

Condition reports can be accessed here www.waterconnect.sa.gov.au/Systems/EPAWQ/Pages/Map.aspx

COOPER CREEK WORKSHOP @ INNAMINCKA

Around 30 people attended the *Understanding the Cooper Creek* workshop in Innamincka in June giving local residents and land managers the opportunity to learn about the Cooper Creek system and to provide input into its future management.

Mining and pastoral industry representatives, Aboriginal Traditional Owners, volunteers and other interested people joined South Australian and interstate presenters to discuss riparian vegetation condition, hydrology, geomorphology, fish distribution, and the cultural landscapes associated with the system.

The workshop examined the current and immediate threats to the system with facilitated group discussions helping identify priorities for future action to ensure sustainable management of the Cooper Creek ecosystems.

LAKE EYRE BASIN RIVERS ASSESSMENT

Over 36,000 fish were sampled across 47 sites in spring and autumn surveys as part of the Lake Eyre Basin Rivers Assessment (LEBRA) in SA, Qld and the NT.

This was a very dry year in comparison to the previous two years, leading to greatly decreased fish distribution and abundance throughout the Basin.

In the autumn surveys, 19 native and three introduced species (Sleepy Cod, Gambusia and Goldfish) were captured, with the latter generally in low abundance.

Bony Herring was the most common, occurring at all 47 sites and accounting for over one third of all fish.

Snake Hole on the Finke River (NT) returned the most fish (nearly 5000), while the lowest was 16 fish at Winton-Jundah Road on the Diamantina River in Qld, and surprisingly only 53 fish at Cullyamurra Waterhole in SA.

Site richness varied from three to 11 species per site.

Department of Environment, Water and Natural Resources, SA Research and Development Institute, Lake Eyre Basin Ministerial Forum, Australian Government

WHAT IS LEBRA?

The Lake Eyre Basin Rivers Assessment (LEBRA) is a long-term project which assesses the condition of the LEB catchments including rivers, floodplains, overflow channels, lakes and wetlands.

Under LEBRA, SA scientists work with their Qld and NT counterparts to assess portions of the Cooper Creek (including the Thomson and Barcoo Rivers), Georgina-Diamantina (including the Warburton Creek), and the Neales, Macumba, and Finke River catchments.

LEBRA uses consistent monitoring techniques to provide long-term data for many waterholes, tributaries, and in some cases whole river systems.

LEBRA is delivered on behalf of the LEB Ministerial Forum which was established in 2000 with representatives from the Australian, SA, Qld and NT governments. LEBRA implements the Lake Eyre Basin Agreement, a cooperative framework for jointly addressing cross-border issues about the management of water and related natural resources.



Our community

138 events, including workshops and field days, attended by **2,361** people

379 volunteers contributed **18,487** hours to flora and fauna surveys, pest animal and plant control, building and maintenance of infrastructure and revegetation

3,328 people, including community members, land managers and volunteers, participated in natural resource management activities

While the SA Arid Lands region’s vastness and remoteness have provided crucial protection to our native plants and animals and ensured the region retains some of the State’s most intact ecosystems, with few on-ground managers in proportion to the region’s size their continued conservation and management can be problematic.

The SAAL NRM Board recognises that people are a critical element to ensuring that our natural resources are managed sustainably – all who live, work or visit the region have a role to play in adopting sustainable practices, and in supporting and participating in programs and projects as groups and individuals.

Effective engagement with local communities is essential for meeting targets identified in the *SAAL Regional NRM Plan*; this section of *On Track* recognises and salutes the outstanding efforts of our community, including industry, local land managers, schools, volunteers and townsfolk striving to reach these shared goals.

Specifically, Natural Resources SA Arid Lands, on behalf of the SAAL NRM Board:

- develops and disseminates up-to-date information on best practice management of natural resource management issues through newsletters, factsheets, reports, site visits, workshops, forums and field days
- provides advice and other support to land managers to help improve knowledge and skills in natural resource management practices, including sustainable pastoral productivity, grazing management, pest animal and plant control, and property planning
- encourages the participation of Aboriginal people in natural resource management activities, including biodiversity conservation projects, sharing traditional and scientific ecological knowledge, property planning, and fencing sensitive sites
- provides advice, support and opportunities to individual volunteers and community groups, including planning and delivery of projects such as community gardens, weed control, fencing areas of high conservation value, and participation in field trips
- develops and delivers appropriate information on natural resource management issues and their management for inclusion in school programs (such as local fauna and flora ecology), interactive workshops to learn how to identify fauna species, and class materials
- engages with industry operating in the area (including mining and tourism companies) to negotiate mutually satisfactory natural resource management outcomes.

Natural Resources SA Arid Lands, on behalf of the SAAL NRM Board, will continue this commitment to improving the capacity of all land managers, residents and industry in the region to manage their backyard effectively, by providing support to develop the necessary skills and ensure access to appropriate information, expertise and programs.

10 YEAR RESOURCE CONDITION TARGETS

9. Equip all people who are actively involved in natural resource management with the information, knowledge and skills needed to support the achievement of *SAAL Regional NRM Plan* priorities

10. Increase by 30% the number of people actively involved in natural resource management and supporting the achievement of the *SAAL Regional NRM Plan* priorities

Mine site on the Old Strzelecki Track



KAREN ENGLISH

Industry partnerships

PARTNERS IN WILD DOG MANAGEMENT

Industry has made a critical contribution to several dingo management programs in the SA Arid Lands in 2012-13, partnering with land managers and SA government agencies.

Since 2011 and with support from the SAAL NRM Board, Santos has been funding important research into the impacts of dingo control on cattle production and biodiversity in northern SA (see p. 16).

Local land manager knowledge and information gained from this research will assist in the development of a wild dog management plan for the region.

South of the Dog Fence, the Sheep Industry Fund and Australian Wool Innovation also made contributions in 2012-13 to the SAAL NRM Board-supported *Biteback* program for wild dog control and Biosecurity SA's aerial baiting program (see p. 17).

Land managers and the SAAL NRM Board are also doing their bit – with the Board directing a portion of the NRM levy collected from landholders into wild dog management on both sides of the Fence.

Meanwhile, the cost of maintaining the Dog Fence continues to be shared on a dollar for dollar basis by landholders, especially sheep producers, and by the SA Government.

Through its support for the Arid Recovery Reserve, BHP Billiton has also supported dingo management in the region (see p. 16-17).

SAAL NRM Board, Natural Resources SA Arid Lands, Biosecurity SA, Dog Fence Board, Sheep Industry Fund, Australian Wool Innovation, Santos, Arid Recovery, BHP Billiton

MINING AND EXPLORATION IMPACTS

Natural Resources SA Arid Lands staff worked with 15 established and emerging mining and exploration companies this year and commented on 101 referrals.

With mining and exploration activity and interest in the SA Arid Lands region continuing to increase in 2012-13, staff continued to provide advice to companies on how to manage their development or activity in an environmentally sensitive manner that minimises the impact on the health and condition of water and soil resources, on native vegetation, and on any known populations of threatened species.

Where native vegetation clearance was proposed, opportunities were identified for offsets along with practical suggestions for minimising clearance.

Relationships are maintained with mining companies from the exploration phase through to production and mine closure and staff often facilitate dialogue between land managers and mining companies.

Minerals exploration activity in the past year was particularly focused in the North East Pastoral district, around the edge of the Gawler Ranges area, and the rapid expansion of gas operations in the Cooper Basin.

SAAL NRM Board, Natural Resources SA Arid Lands, Department of Environment, Water and Natural Resources, Department for Manufacturing, Innovation, Trade, Resources and Energy

GET INVOLVED

If you or your organisation are proposing a new development or activity that may impact the SA Arid Lands region's natural resources, contact Natural Resources SA Arid Lands 8648 5300 to ensure you have access to up-to-date information to account for natural resource management in your planning and decision-making

Volunteers

BLINMAN-PARACHILNA PEST PLANT CONTROL GROUP

The Blinman-Parachilna Pest Plant Control Group – a decade-long partnership between Flinders Ranges pastoralists, contractors and Adelaide-based volunteer groups – continued their Wheel Cactus and Oleander control across a 40,000 hectare area of the North Flinders.

Land managers, contractors and volunteers all reported widespread recruitment of Wheel Cactus, which was anticipated following two wet years. However, overall numbers were down, indicating the group is maintaining control and gradually depleting the infestation.

Contractors continued their work treating Wheel Cactus this year, concentrating on areas that aren't easily reached or suitable for the Group's band of volunteers. About 3500 plants were treated including a large grove of 655 plants near the lower pools in Parachilna Gorge, 193 plants along the road reserve through the Gorge, and 1015 plants on the cliff-faces above the Gorge where the contractors must abseil in order to reach the plants. Just 40 of the original 320 hectares requiring specialised cliff-face control remain and will be treated next year.

Here are some of the other highlights.

SAAL NRM Board, *Natural Resources SA Arid Lands, State Community NRM Grant, Australian Government*

Biocontrol

This year biocontrol agents were used to manage Wheel Cactus for the first time after a strain of the Cochineal insect *Dactylopius opuntiae* was found to have spread well beyond its initial 2008 trial site on Gum Creek Station. More Cochineal was released into the core area, at other locations with high recruitment levels, and at localised recruitment 'hot spots'. This Cochineal strain is being managed at nurseries on Oratunga and Wirrealpa Stations.

Meanwhile, the Group has been working with Roger Christopherson, a retired kangaroo shooter who has been breeding *Cactoblastis* at his Stirling North home. *Cactoblastis* from Roger's lab was released in March on a dense infestation of Prickly Pear on Angorichina Station. This new material supplemented a local *Cactoblastis* population that was observed to be widespread and active on Prickly Pear east of Blinman. The Group are monitoring *Cactoblastis* effectiveness because of concerns about its ability to remain active during prolonged dry periods.

Volunteer activities

This year 83 volunteers from various volunteer groups continued their work on four pastoral properties within the project area treating 5879 Wheel Cactus plants and 12 Oleander plants.

Adelaide Bushwalkers Club

Twelve volunteers spent one week in August 2012 treating 950 Wheel Cactus on Gum Creek Station near the Flinders Ranges National Park boundary.

Toyota Landcruiser Club

Forty-one volunteers treated 3079 plants on Gum Creek Station over two weeks in April-May 2013 removing 108 seedlings under a single tree.

Mitsubishi 4WD Club

Eight volunteers spent six days on Moolooloo Station in October 2012 treating 380 Wheel Cactus plants. The group also inspected a small trial site established in 2011 to test the effectiveness of different injection rates.

Blackwood Church of Christ

Seven members undertook their bi-annual inspection of Parachilna Gorge for new Oleander seedlings in April finding just 12 plants recruited from the original 10 kilometre infestation they eradicated in 2010. The volunteers also treated and/or removed Castor Oil bushes and Wheel Cactus seedlings.

Australian Retired Persons Association

A planned activity on Alpana Station had to be cancelled due to unforeseen circumstances but the group is planning to return next year.

Other

Fifteen volunteers representing six different clubs – Overland 4WD Group, Australian Retired Persons Association, Adelaide Bushwalking Club, Keep Walking Club, Bicycle SA, Toyota Landcruiser Club – spent a week at Oratunga in August 2012 treating Wheel Cactus along the Alpana/Moolooloo boundary. The group treated 1470 plants in total.

Volunteers looking over Alpana Station



GREAT TRACKS CLEANUP

Twenty-seven Great Tracks Cleanup Crew members, their families and friends took part in the annual cleanup in July 2012, collecting over 38 tonnes of rubbish from the region's outback tracks and roads and donating 3254 volunteer hours.

A total of 17,210 kilometres was travelled by the vehicles on the six day trek.

Departing Leigh Creek, one team travelled to Lyndhurst and then along the Strzelecki Track to Montecollina Bore while another team travelled to Montecollina Bore via Copley, Iga Warta, Nepabunna, Balcanoonna and Mount Hopeless. The crew then went on to clean Della Road and Dillons Highway to Innamincka and the Cordillo Road and Arrabury Road. ABC TV's Landline crew joined the team at Birdsville filming the cleanup as it made its way south down the Birdsville Track.

Rubbish included general camping and household waste, various truck, trailer and vehicle parts – including tyres, rims, differentials, rusted out water tanks, and fuel tanks – and galvanised iron sheeting, bottles and cans.

Founded in 2007 by volunteers from the Leigh Creek SES Unit, the Great Tracks Cleanup is a not for profit initiative run by volunteers who give their time and vehicles to clean up outback tracks and roads.

FRIENDS OF MOUND SPRINGS

Friends of Mound Springs members continued their work improving visitor management at Strangways Springs, The Peake Repeater Station Ruins and around Freeling Springs. These nationally important sites off the Oodnadatta Track are a combination of mound springs and ruins of Overland Telegraph Repeater Stations.

Group members returned in May and June to undertake maintenance of the self-guided walking trails, restock brochures, and install additional signage at Strangways.

FOMS helped secure Australian Government funding to develop management prescriptions for mound springs.

The Friends of Mound Springs group was established in 2006 and currently has 80 members.



A Red-backed Kingfisher impaled on a small Jumping Cholla plant and (left) a Jumping Cholla infestation

ARKARoola LANDCARE GROUP

The Arkaroola Landcare Group returned to Arkaroola in 2013 to continue its work controlling Jumping Cholla, an invasive Weeds of National Significance-listed Opuntoid cactus.

All areas where Jumping Cholla had been previously found and treated were re-surveyed with an additional 250 hectares inspected.

Plant numbers were well down – the group treated 2950 plants compared with 4562 in 2012, despite spending an additional week in the field in 2013.

A cactus sighting register was established to encourage visitors to report any cactus plants they see on the sanctuary. Several outliers, well beyond the treated area, were reported. These were treated by the Landcare Group.

The group also undertook rabbit control and set up a monitoring program for two threatened plant species: Spidery Wattle and Slender Bell-fruit Tree.

Arkaroola Wilderness Sanctuary, SAAL NRM Board, Natural Resources SA Arid Lands



Arkaroola Landcare Group setting out for a day of cactus killing

THANK YOU

The efforts of the region's volunteer groups were formally recognised by the SAAL NRM Board at a Volunteer Appreciation Evening held in Adelaide in May.

The event brought together 46 representatives from various Friends of Parks groups, 4WD clubs, walking groups and church groups as well as the Sporting Shooters Association and Great Tracks Cleanup Crew.

'We are indebted to all volunteers in the region who are contributing to natural resource management,' said Murray Tyler, SAAL NRM Board member during his welcome speech.

'Many of our volunteers are Adelaide-based and they combine volunteering with their travel and enjoyment of the SA Arid Lands region.

'Whether the work occurs on National Parks or on private land, we all benefit from the volunteer efforts and it is all contributing to the targets in our Regional NRM Plan.'

The SAAL NRM Board extends its gratitude for all volunteer contributions to natural resource management in the region, and acknowledges that only a tiny proportion of this work is highlighted in the pages of *On Track*.

GET INVOLVED

If you would like to find out what opportunities exist for volunteering in the region please contact Natural Resources SA Arid Lands 8648 5300

Friends of Simpson Desert members at the Dalhousie Ruins stockyard during their May working bee



FRIENDS OF SIMPSON DESERT

Friends of Simpson Desert held their annual working bee in May at various sites in Witjira National Park and in the Simpson Desert Regional Reserve and Conservation Park.

Twenty-four members contributed 2334 hours clearing overhanging vegetation along the Homelands track; defining walking tracks and installing signs at Dalhousie; installing protective fencing at the main Dalhousie Spring; assisting with the restoration of the Dalhousie Ruins; undertaking fence patrols along the Macumba-Witjira boundary; surveying Marsupial Moles and other mammals in the Simpson Desert; and fencing the Umbutchera lookout. Rabbit control was also carried out at the Dalhousie Ruins and Umbutchera Creek.

The Friends of Simpson group was established in 1986 and currently has 115 members.

FRENCH'S FOREST BAPTIST CHURCH, NSW

Eight adults undertook cactus and feral animal control on Bullyaninnie Station in the North East Pastoral district in December 2013 contributing 392 volunteer hours. This is the fifth year that a group of young adults has travelled 1600 kilometres from Sydney to volunteer their time on this property.

FRIENDS OF INNAMINCKA RESERVE

Friends of Innamincka Reserve undertook their annual working bee at Innamincka in August 2012 contributing 924 hours.

The Friends undertook general maintenance in and around the Australian Inland Mission building, tidied campfire sites, cleared vegetation, controlled erosion, removed flood debris, replaced broken bollards and cabling, erected new fencelines, and checked tracks for feral weeds.

Members also weeded and tidied gravesites at the cemetery, removed weeds and debris from fencelines and yards in the town area, continued their ongoing bird survey in the Reserve, and assisted the Innamincka Sporting Club with their preparations for the annual race day.

The group was established in 1999 and currently has 52 members.

Volunteers

WORKING WITH VOLUNTEERS BOOKLET

A new booklet – *Working with Volunteers: advice for land managers in the South Australian Arid Lands* – was released in May to encourage pastoralists and other land managers to 'dump their assumptions' about using volunteers on their properties.

The booklet borrows from the lessons of the Blinman-Parachilna Pest Plant Control Group (see p. 30) and has been used to sponsor a drive to connect more land managers with volunteers.

All land managers in the region were mailed a copy in June along with an expression of interest form for using volunteers on their property for activities such as weed and erosion control, fencing waterholes and springs, threatened species conservation, revegetation, restoration and maintenance of heritage sites, and wildlife, and vegetation monitoring.

Using the words of pastoralists and volunteer coordinators, the booklet profiles the volunteer partnerships at Moolooloo, Alpana and Gum Creek Stations. It also outlines land manager obligations and responsibilities, opportunities and resources, and indicates where the Natural Resources SA Arid Lands Volunteer Program can provide assistance in finding volunteers, planning a volunteer activity, insurance cover, funding opportunities, and technical advice.

'We hope that by getting this publication out to the region's land managers we'll generate new volunteer experiences, which we can use to encourage new volunteers to the region and to offer different experiences to our existing volunteers,' said Ms Janet Brook, Presiding Member, SAAL NRM Board.

The information is being used to test the level of interest in using volunteers on property and to refine the Natural Resources SA Arid Lands Volunteer Program.

SAAL NRM Board, Blinman-Parachilna Pest Plant Control Group, Natural Resources SA Arid Lands, Australian Government



WALKING TRAILS SUPPORT GROUP

The Walking Trails Support Group travelled to the Vulkathunha-Gammon Ranges National Park in June 2013 with seven volunteers. Volunteers restocked leaflets, cleared interception drains and creek crossings, checked direction, distance, checkpoint and interpretive way markers, and improved track surfaces along walking trails.

The group grew out of an initiative of the Royal Geographical Society SA in 1992, but did not become an official Friends of Parks group until 1999. Currently the group has 24 members.



North Flinders plant ID workshop

Community events

Our community

NORTH FLINDERS PLANT ID WORKSHOP

About 30 people attended a plant identification workshop at Commodore Station in July 2012 held in response to the germination of plants not commonly seen in the region as a result of the recent rains.

After an opening address from Ian Ferguson, North Flinders NRM Group member, and a presentation from Greening Australia's Mick Durant on plant identification theory and practical tips, the group – a mix of land managers, government

and Australian Arid Lands Botanic Garden staff – attempted to identify plants around the homestead.

The day finished with information on how to collect and press plant specimens and suggestions on where to find further assistance with plant identification as well as a brief presentation on monitoring goat browse and their preferred species.

North Flinders NRM Group, SAAL NRM Board, Natural Resources SA Arid Lands, Greening Australia

HAWKER BESTPRAC FORUM

Thirty-one people – a mix of pastoral land managers, industry, government representatives and guest speakers – attended a Bestprac Forum in Hawker in May.

Looking Beyond the Horizon examined a number of topics, many of them emerging issues with uncertain impacts on pastoral land management. Topics included how to source and utilise climate information to manage climate variability and livestock carbon emissions; emerging opportunities in the wool market; succession planning; and the use of remote sensing and mapping technologies as a property management tool.

Other presentations centred on the benefits of Ecosystem Management Understanding (EMU)TM and its approach combining land manager knowledge with scientific expertise (see p. 15), and the growing threat of wild dogs and the need for coordinated, landscape-level control (see p. 17). Land managers even saw opportunities for the integration of several of these tools and techniques in their property management planning.

Updates were also presented by representatives of the SA Sheep Advisory Group, Natural Resources SA Arid Lands and Bestprac Network.

SAAL NRM Board, Bestprac, Australian Wool Innovation, Natural Resources SA Arid Lands, Australian Government

COMMODORE STATION GIFT LAND TO NATIONAL PARK

Commodore Station donated 2600 hectares to the Flinders Ranges National Park this year with the gift marked by a commemoration at the homestead in July 2012. The scenic land with its steep gorges and outwashes is geologically and culturally significant, both to the Adnyamathanha people and the McAuley family who took up the land in the area in 1882. The land was donated by Commodore Station owners Ian McAuley and Carola Cox and will be managed for conservation by the Flinders Ranges National Park Co-management Board.

Commodore Station, Department of Environment, Water and Natural Resources, Flinders Ranges National Park Co-management Board

CARBON FARMING WORKSHOPS

Eighty-five people, including pastoralists, SAAL NRM Board and Pastoral Board members, and representatives of Aboriginal communities and mining companies, attended eight Carbon Farming Initiative (CFI) workshops in the SA Arid Lands this year.

Held in conjunction with NRM Group meetings and with a number of Aboriginal community groups, the workshops were an opportunity to raise awareness about the Australian Government's Carbon Farming Initiative, the carbon market, threats and opportunities, and to find out pastoral and Aboriginal communities' priorities.

Participants were able to ask about carbon credits, the science and economics of climate change, and learn about opportunities for a carbon economy in the rangelands.

The CFI is a voluntary carbon offset scheme introduced by the Australian Government in December 2011 to encourage land-based activities to reduce greenhouse gas emissions and provide opportunities for land managers to participate in carbon markets.

Opportunities for the rangelands are still being investigated but might include carbon storage in plants through the management of grazing pressure and decreasing emissions through the management of fire regimes and destruction of feral ruminants.

The workshops were held at Port Augusta (3), Coober Pedy (2), Leigh Creek (2), and Glendambo.

SAAL NRM Board, Canopy, Natural Resources SA Arid Lands, Australian Government

Community events

Yunta Races



AUSTRALIAN RANGELANDS SOCIETY CONFERENCE

Two land managers were sponsored to attend the Australian Rangeland Society (ARS) Conference in Kununurra in September 2012.

Glen Norris, then manager of Bon Bon Station near Coober Pedy, found his first ARS Conference an opportunity to network with people from different land uses and from multiple roles: 'The rangelands focus for this conference meant that there was an opportunity to interact with a variety of like-minded people and develop strong linkages through talking and sharing ideas.'

Douglas Lillecrapp (Todmorden Station) also enjoyed the opportunity to talk to rangelands managers and scientists and the opportunity to visit Newry Station on a field trip, where he reported back his concerns that the rangelands are facing increasing operating costs and an increasing risk from fire.

SAAL NRM Board, Australian Rangelands Society

NRM @ RACEDAYS

Natural Resources SA Arid Lands staff visited racedays across the region, operating stalls at the Copley and Glendambo Gymkhanas and the Yunta, Oodnadatta and Marree Races, and attracting about 140 race-goers.

Talk of dingoes, stuffed Cane Toads, Dusky Hopping Mouse, a display of stuffed rodents and marsupials, and preserved specimens of various snakes and frogs, brought people of all ages to the stalls.

SAAL NRM Board, Natural Resources SA Arid Lands, SA Museum, BHP Billiton

SCIWORLD ROXBY DOWNS

Over 50 kids visited a stall at the 2013 SciWorld held in Roxby Downs in March where they made animal tracks in the sand using stamps of common native and invasive Australian species – emus, dingoes, cats and kangaroos – and identified the tracks of other animals including Bustards and Sleepy Lizards.

SAAL NRM Board, Natural Resources SA Arid Lands, Arid Recovery, Australian Government

GET INVOLVED

If your school, community group or Progress Association have ideas for natural resource management projects or would like to take part in our *Tracks and Scats Workshop* or other activities contact Natural Resources SA Arid Lands 8648 5300

SCHOOL OF THE AIR

Over 20 School of the Air students participated in a *Tracks and Scats Workshop* at Port Hughes as part of their annual catch-up in April.

The students, from years 3 to 7, searched the beach for evidence of critters including birds and dogs, made and studied their own tracks to understand how tracks can change depending on what we're doing, and made their own animal scats (or poos!) using modeling compounds.

Tracks and Scats Workshops help people to read the landscape and detect signs of animals through the tracks they leave in the sand or through their scats, burrows and diggings, and can increase our understanding of the distribution and abundance of a range of threatened and introduced animals in the arid zone.

SAAL NRM Board, Natural Resources SA Arid Lands, Australian Government

ARID RECOVERY EVENTS

The Arid Recovery Open Day brought over 100 people to the Reserve in August 2012 to celebrate 15 years of operation. Past and present volunteers, and visitors from Roxby Downs community, took part in tag-along 4WD tours of the Reserve, guided tours of the interpretive nature trail, and heard stories of the Reserve's history and achievements.

Twenty-nine attendees from the Mammal Conference held in Port Augusta in August 2012 visited the northern-most expansion of the Reserve where they learned about the Dingo Project (see p. 16) and the impact of feral animals on arid zone ecosystems. They also toured the interpretive nature trail and trapped Bettongs and Spinifex Hopping Mouse.

Thousands of people attended Arid Recovery's stall as part of the Science Alive! festival at the Wayville Showgrounds in August 2012 where scat-making and a hands-on display of skins and skulls were a hit with the kids.

On World Environment Day in June, 45 people attended Arid Recovery's thank you night for its supporting businesses and organisations.

Arid Recovery, Adelaide University, Natural Resources SA Arid Lands, Friends of Arid Recovery, BHP Billiton

CO-OPERATIVE PARK MANAGEMENT

The Co-management Boards and Advisory Committees have each had a productive year with 13 meetings between them and progress on developing and implementing their Park management plans.

The co-management model for parks management in SA was introduced in 2004 when the *National Parks and Wildlife Act 1972* was amended to enable the Department of Environment, Water and Natural Resources to share responsibility for the management of national and conservation parks with the relevant Aboriginal group. This occurs through the creation of either a co-management board or a co-management advisory committee.

The SA Arid Lands region has a network of 17 parks and reserves which are a vital community asset that are critical for the long term protection of our natural and cultural heritage. They also offer our growing tourism industry a limitless number of memorable experiences in harmony with conservation.

There are currently four co-management boards and two advisory committees in the SA Arid Lands region responsible for the parks in our region.

WITJIRA NATIONAL PARK CO-MANAGEMENT BOARD

Established 2005

NATIVE TITLE GROUP: Irrwanyere Aboriginal Corporation

OVERSIGHT OF: Witjira National Park

2012-13 STATUS: Approved wood fire ban policy, designed and developed park entry statements and interpretive shelters, approved interpretive signage and plans for further stabilisation of the State heritage-listed Dalhousie ruins

VULKATHUNHA-GAMMON RANGES CO-MANAGEMENT BOARD

Established 2005

NATIVE TITLE GROUP: Adnyamathanha Traditional Lands Association

OVERSIGHT OF: Vulkathunha-Gammon Ranges National Park
2012-13 status: Commenced development of a fire management plan for the northern Flinders Ranges, designed and developed park entry statements, developed a bush tucker walking trail located at Weetootla

FLINDERS RANGES CO-MANAGEMENT BOARD

Established 2011

NATIVE TITLE GROUP: Adnyamathanha Traditional Lands Association

OVERSIGHT OF: Flinders Ranges National Park, Bimbowrie Conservation Park, Yalpara Conservation Park, Ediacara Conservation Park, and Black Rock Conservation Park
2012-13 STATUS: Commenced development of a new Park management plan and interpretive plan that reflects Adnyamathanha aspirations, commenced a fire management plan, provided advice about major events held on Flinders Ranges National Park (XPD bike race, Wilpena under the Stars, Outback Ballooning etc.)

GAWLER RANGES CO-MANAGEMENT BOARD

Co-management Agreement entered into 2011

NATIVE TITLE GROUP: Gawler Ranges Aboriginal Corporation

OVERSIGHT OF: Lake Gairdner National Parks and advisory role over Lake Gilles Conservation Park

2012-13 STATUS: Board membership has been established and the inaugural meeting is planned for December 2013

ARABANA PARKS ADVISORY COMMITTEE

Co-management Agreement entered into 2012

NATIVE TITLE GROUP: Arabana Aboriginal Corporation

OVERSIGHT OF: Wabma-Kadaru Mound Springs Conservation Park, Lake Eyre National Park and Elliot Price Conservation Park

2012-13 STATUS: Committee membership has been established and the inaugural meeting is planned for August 2013

YANDRUWANDHA YAWARRAWARRKA PARKS ADVISORY COMMITTEE

Established 2010

NATIVE TITLE GROUP: Yandruwandha Yawarrawarrka Traditional Land Owners (Aboriginal Corporation)

OVERSIGHT OF: Coongie Lakes National Park and with advisory role over Innamincka Regional Reserve and portion of Strzelecki Track

2012-13 STATUS: Committee has made progress on the Coongie Lakes National Park Management Plan

Aboriginal land management

Everybody's land:

A strategy for Aboriginal Partnerships in the SA Arid Lands Natural Resources Management Region



ABORIGINAL PARTNERSHIPS STRATEGY RELEASED

The SAAL NRM Board has finalised its strategy for building Aboriginal partnerships. The publications – *Everybody's land: a strategy for Aboriginal partnerships in the SA Arid Lands Natural Resources Management region* – was developed with the input of a range of Aboriginal and regional stakeholders and is built on feedback from prior engagement activities.

It describes the SAAL NRM Board's vision, guiding principles, strategies and success measures when working with Aboriginal partners and participants across the SA Arid Lands region.

The strategy takes into consideration the needs of Aboriginal groups, and provides a basis for all other stakeholders to understand what will be required when working on country with Aboriginal groups in the region.

SAAL NRM Board, *Natural Resources SA Arid Lands, Australian Government*

UMOONA WEED CONTROL

Seven community members from Umoona and Mount Willoughby Station completed a two-day chemical accreditation course at Umoona in November 2012.

The training means that the Umoona community and Mount Willoughby Station have improved capacity to carry out weed control using scheduled chemicals not usually available to the public.

The course combined theory with practical demonstrations as well as opportunities for participants to practice activities including measuring quantities of chemicals and spraying techniques.

Participants were also trained in the use of an injection gun for cactus control and in safely handling, mixing and storing chemicals, and reading and understanding labels.

The training was used in June to tackle Buffel Grass around Umoona and the Coober Pedy township.

SAAL NRM Board, *Natural Resources SA Arid Lands, Umoona Community Council, District Council of Coober Pedy, Community Action Grant, Australian Government*

Aboriginal land management



The Nipapanha area in the North Flinders district

NIPAPANHA CARBON FARMING TRIAL

The Nipapanha community in the North Flinders secured a grant to investigate the feasibility of mounting a carbon farming project under the Australian Government's Indigenous Carbon Farming Fund. The grant will provide the community with access to training and assistance to develop business ideas for gaining additional income by creating carbon credits. It will also allow the community to use their existing skills in vegetation management and business development, and it is seen as a potential model for other Aboriginal communities who may seek to manage their country in this way. The focus of the work will be on Nantawarrina Indigenous Protected Area, 58,000 hectares of land located between the Flinders and Gammon Ranges National Parks.

Nipapanha Community Inc, Canopy, Greening Australia, Australian Government

LEIGH CREEK STATION CONSERVATION

An infestation of Pepper Tree and Mexican Poppy was removed along a two kilometre stretch of Leigh Creek on the Spring Paddock lease of Leigh Creek Station in an effort to prevent further spread of the weeds downstream.

With the broader goal of removing grazing and conserving the land for biodiversity, feral animals were also removed including 40 goats and 15 sheep. A water-ponding trial was established on a relatively flat area that had been rendered completely barren by sheep grazing. With the sheep now removed the site is being monitored for improvement in water filtration and the return of native vegetation.

SAAL NRM Board, *Natural Resources SA Arid Lands, Yartawarli Aboriginal Corporation, Australian Government*

CHAMBERS GORGE

The Adnyamathanha Traditional Lands Association (ATLA) completed a management plan for Chambers Gorge in June. ATLA have been concerned for many years about damage to this Flinders Ranges site and, in particular to the ancient rock engravings and the creek bed and banks which have been damaged by visitors and vehicles.

The Gorge is also habitat for the threatened Yellow-footed Rock-wallaby. This is the first management plan to have been written from the perspective of the Traditional Owners. Among the recommendations were to restrict vehicle access and to install signs informing visitors of the site's cultural significance and directing walkers to the engraving sites.

SAAL NRM Board, *Natural Resources SA Arid Lands, Adnyamathanha Traditional Lands Association, Australian Government*

GAWLER RANGES ROCKHOLE PROTECTION

Western and cultural knowledge were combined this year to restore and protect rockholes in the Gawler Ranges.

Aboriginal community members and scientists assessed the ecological and cultural values of 16 rockhole complexes on Pinjarra, Siam, Uno, Kolendo, Buckleboo, and Hiltaba Stations. Previously assessed sites and monitoring points on Wilgena and Nonning Stations were also revisited with a number of rockholes cleaned to remove sediment.

On Thurlga Station, a specific program was initiated to control feral goats. Four members of the local Aboriginal community worked with the land manager to deliver on-ground works constructing two permanent waterpoint trapping yards which will be used to trap and remove feral goats in the height of summer when the rockholes are dry.

Work was undertaken around rockholes to control Horehound and other weeds and to remove sedimentation, while four areas which have been historically degraded were destocked and revegetated by direct seeding. Further revegetation was also undertaken on Hiltaba and Yardea stations.

SA Native Title Services, Gawler Ranges Aboriginal Corporation, Department of Environment, Water and Natural Resources, Australian Government



Aaron Stuart and Millie Warren with Minister Hunter at the special signing ceremony at Finnis Springs in May

FINNISS SPRINGS HANDED BACK

The Arabana Aboriginal Corporation signed a 99-year lease over the former Finnis Springs Station in the Marree-Innaminka district in May.

A special signing ceremony was held at the site of the property's former mission and on the first anniversary of the Federal Court determination of native title over the area surrounding Finnis Springs.

The land will be managed by the Arabana Aboriginal Corporation on behalf of the Arabana people who will be free to run tourism activities on the properties that are consistent with conserving the environmental and cultural values of the land.

Arabana Aboriginal Corporation

LAKE EYRE CO-NAMED

A ceremony celebrating the renaming of Lake Eyre as Kati Thanda-Lake Eyre was held at Finnis Springs in May. The dual name was approved by SA's Geographical Names Committee in December 2012 to recognise the significance of Lake Eyre to the Arabana people.

SA Geographical Names Committee

MODERNISING WITJIRA

Witjira National Park has been modernised with new entry statements representing both breakaway and sand dune country replacing its old green signs. Located at Pedirka, Bloods Creek and Finke/Charlotte Waters, the statements feature laser cut springs and spring tails as well as a Perentie, a large monitor lizard which is significant to the Traditional Owners. Interpretive shelters and signs welcoming visitors to the park have also been installed at Pedirka, Bloods Creek and Mt Dare. The redevelopment will improve visitor experience to this remote park.

Witjira National Park Co-management Board, Natural Resources SA Arid Lands

NANTAWARRINA QUANDONG NURSERY

An area around Angus Hut at Nantawarrina Indigenous Protected Area which has been degraded through over-grazing and erosion is being turned into a Quandong nursery.

The proximity of the site to water and favourable soil conditions has made this an ideal site to rehabilitate. The nursery will provide shelter to native fauna and assist in stabilising the ground and reducing further degradation.

The project will allow the Nipapanha Community to use their existing skills to explore the commercial potential of a Quandong nursery and resulting products.

An irrigation system was installed and maintenance such as watering, pruning, harvesting and fertilising will be carried out by community members.

SAAL NRM Board, Natural Resources SA Arid Lands, Nipapanha Community Inc, Australian Government

WOOD FIRES PROHIBITED ON WITJIRA

Wood fires were prohibited in Witjira National Park in January. This was the final step in a staged approach which saw the collection of wood for campfires banned in 2012.

The wood campfire is an iconic experience but years of firewood collection by visitors – including some irresponsible collection and use – prompted the Board's decision which will help protect the Park's biodiversity.

Alternative solid fuels, such as briquettes, can be used in an enclosed container but both need to be supplied by the visitor and they are not permitted during days of Total Fire Danger.

Witjira National Park Co-management Board, Natural Resources SA Arid Lands

DON'T FORGET YOUR DESERT PARKS PASS

If you are planning to travel to the National Parks and Reserves in the SA Arid Lands you may need to purchase a Desert Parks Pass. The Desert Parks Pass provides 12 months unlimited entry (and camping where permitted) to seven Desert Parks, as well as a comprehensive 4WD handbook and maps, hints, tips and attractions.

A Desert Parks Pass is a condition of entry for the Simpson Desert Conservation Park and Regional Reserve or any travel east of Dalhousie Springs.

For further information contact Natural Resources SA Arid Lands 8648 5300



New entry statement

NRM Group activities



New signage near Coober Pedy



GAWLER RANGES

The GR Group have been active in the promotion of *Biteback* in the district with Group members leading two Local Area Planning groups and suggesting an additional option for pastoralists to report wild dog activity in the region (see p. 17).

With the Cultana Defence training site expanding to incorporate five surrounding pastoral leases, the Group also worked with the Department of Defence to ensure pest plant and animal control continues to be undertaken on these properties and that land damage from training activities is reduced.

The group also monitored other mining activities in the region and a Carbon Farming Information session was held in November 2012 (see p. 33).

CHAIR: Sandy Morris

MEETINGS: 4

DISTRICT PRIORITY ISSUES: Goats, wild dogs, foxes, cats and rabbits

KINGOONYA

The K NRM Group was involved in the delivery of 11 visitor information signs at rest areas along the Stuart Highway to raise travellers' awareness on weeds, the region's unique native animal and plant species, road conditions, and remote travel and camping etiquette.

The Group have maintained their interest in protecting the iconic Western Myall tree, actively raising awareness about responsible pruning and firewood collection. With a fire near Glendambo destroying nearly half of the Western Myall White Fly monitoring sites, the Group are considering an alternative approach to investigating this phenomenon which has periodically caused localised Western Myall dieback.

The Group's spray unit has been used to deliver Buffel Grass control at Bon Bon Station and Umoona near Coober Pedy. The K Group has continued their support for the EMU™ program (see p. 15), which operates on two properties in the district, aerial baiting and ground baiting dingo control programs (see p. 17), and participated in a Carbon Farming Workshop in December 2012 (see p. 33).

CHAIR: Julie-Ann Mould (Graeme Noll from October 2013)

MEETINGS: 4

DISTRICT PRIORITY ISSUES: Wild dogs, rabbits, Buffel Grass, foxes, cats and Western Myall White Fly

MARREE-INNAMINCKA

The MI Group contributed to the development of a survey of the district's land managers to gather information on wild dog management which will contribute to Biosecurity SA's wild dog management plan. The Group continued to work through engineering issues with DTEI and Santos and their ongoing plan to develop a 'fish ladder' at the Innamincka Causeway site; revised and reprinted their *Legendary Tracks* brochure and renewed visitor information centre supplies; and provided guidance on the *Understanding the Cooper Creek* workshop (see p. 27) and the Diamantina catchment pig management program (see p. 12).

CHAIR: Maree Morton (resigned)/ Raylene Ogilvy (from June 2013)

MEETINGS: 4

DISTRICT PRIORITY ISSUES: Dingos/wild dogs, mining and exploration impacts, tourism impacts, and rabbits

Communications

ACROSS THE OUTBACK

Across The Outback, a respected newsletter of 22 years standing, continued its role as a 'one-stop-shop' to information from SA Government agencies operating in the region. *Across The Outback* has become an essential read for around 1500 people or organisations with a stake or interest in the SA Arid Lands region including pastoralists, conservation, recreation and tourist groups, and the media. Five editions were produced in 2012-13.

SAAL NRM Board, Natural Resources SA Arid Lands, Pastoral Board, Biosecurity SA, Australian Government

GET INVOLVED

Contributions from all government agencies and community groups with information relevant to the region are welcome. If you would like to join the **Across The Outback** mailing list or contribute an article contact **Natural Resources SA Arid Lands 8648 5300**

MEDIA

Local media such as ABC North & West, the Roxby Downs papers, and the Port Augusta Transcontinental remain an important avenue for raising community awareness about a range of natural resource management issues. In 2012-13, wild dog management remained a hot topic but other issues to score a mention were various pest plant and animal control programs and grants, Dusky Hopping Mouse, and the Natural Resource Centre opening in Port Augusta.

CHECK OUT OUR WEBSITE

The Natural Resources SA Arid Lands website is a hub of activity containing the latest natural resource management news, publications, events and news. If you are after the latest on natural resource management in the region visit www.naturalresources.sa.gov.au/aridlands



Mimosa Bush (*Acacia farnesiana*)



MARLA-ODNADATTA

The MO Group completed its *Mimosa Bush* project (see p. 10) and purchased a small spray unit for wider land manager use in the district.

The Group contributed to the development of a survey of the district's land managers to gather information on wild dog management which will contribute to Biosecurity SA's wild dog management plan (see p. 16), and provided support for EMU™ activities including a *Soil Conservation Workshop* on Wintinna Station (see p. 15) and on-ground works on Hamilton Station.

CHAIR: Mark Fennell

MEETINGS: 4

DISTRICT PRIORITY ISSUES: Mining and exploration impacts, wild dogs, foxes, cats and rabbits

NORTH EAST PASTORAL

There was no operating NRM Group in the NEP district in 2012-13 but the pages of *On Track* provide a record of the many natural resource management activities that are occurring here. We are pleased to report that a Group was formed in June chaired by Glen Norris. See next year's *On Track* for their first annual report...

NORTH FLINDERS

The NF Group new issues-based approach to their meetings attracted 43 additional community members. A plant ID workshop was held in July 2012 (see p. 33) and a carbon opportunities workshop in November 2012 (see p. 33). The Group have continued its strong advocacy of wild dog control supporting a workshop which looked at the development of a wild dog incentive program (see p. 17). They also met with a Dog Fence Board representative in June to talk about fence repairs in emergency situations (eg floods). The Group continued to promote land manager involvement in wild dog control (see p. 17). Members seek regular updates from the *Bounceback* conservation program and are committed to its goat and fox control measures and increasing community participation (see p. 9).

CHAIR: Keith Slade

MEETINGS: 5

DISTRICT PRIORITY ISSUES: Goats, wild dogs, weeds, foxes, cats and rabbits

GET INVOLVED

Do you live or have an interest in the SA Arid Lands region? Are you interested in providing a local perspective to the Board on key natural resource management issues in your district or driving natural resource management projects? Then perhaps you'd like to be a Group member. To register your interest contact Natural Resources SA Arid Lands 8648 5300

Publications

LAND AND BIODIVERSITY

Allen BL 2012 The effects of lethal control on the conservation values of *Canis lupus* dingo. In *Wolves: Biology, behavior, and conservation*, eds AP Maia and HF Crussi, pp 79-108, Nova Science Publishers: New York.

Allen BL 2012 Do desert dingoes drink daily? Visitation rates at remote waterpoints in the Strzelecki Desert. *Australian Mammalogy* 34(2): 251-256.

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Allen BL 2012 A survey of fauna found in dingo scats on Cordillo Downs Station, November 2010-June 2011. Pest Animal and Wildlife Sciences, Toowoomba.

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Allen BL, Fleming PJS, Allen LR, Engeman RM, Ballard G, Leung LK-P 2013 As clear as mud: a critical review of evidence for the ecological roles of Australian dingoes. *Biological Conservation* 159: 158-174.

Bellchambers K and Brandle R 2013 *Landscape scale reduction in risk of soil erosion in the Flinders-Olary Bioregion: assessing goat impacts to guide management*. Natural Resources SA Arid Lands, Port Augusta.

Department of Environment, Water and Natural Resources 2013 *2014 Quota Report for Commercial Kangaroo Harvest in South Australia*. Department of Environment, Water and Natural Resources, Adelaide.

Gillam S and Urban R 2013 *Regional Species Conservation Assessment Project, Phase 1 Report: Regional Species Status Assessments, Outback Region*. Department of Environment, Water and Natural Resources, South Australia.

Greenville AC, Wardle GM and Dickman CR 2013, Extreme rainfall events predict irruptions of rat plagues in central Australia *Austral Ecology* 38: 754-764.

McIlwee A, Rogers D, Pisanu P, Brandle R and McDonald J 2013 Understanding ecosystem dynamics in South Australia's arid lands: a framework to assist biodiversity conservation *The Rangeland Journal* 35: 211-224.

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Pavey CR and Nano CEM 2013 Changes in richness and abundance of rodents and native predators in response to extreme rainfall in arid Australia. *Austral Ecology* 38: 777-785.

Reside AE, Van Der Wal J, Phillips BL, Shoo LP, Rosauer DF, Anderson BJ, Welbergen JA, Moritz C, Ferrier S, Harwood TD, Williams KJ, Mackey B, Hugh S, Williams YM and Williams SE 2013 *Climate change refugia for terrestrial biodiversity: defining areas that promote species persistence and ecosystem resilience in the face of global climate change*. National Climate Change Adaptation Research Facility, Gold Coast, 216 pp.

Tischler M, Dickman CR and Wardle GM 2013 Avian functional group responses to rainfall across four vegetation types in the Simpson Desert, central Australia. *Austral Ecology* 38: 809-819.

Wardle GM, Pavey CR and Dickman CR 2013 Greening of arid Australia: new insights from extreme years. *Austral Ecology* 38(7): 731-740.

DID WE MISS YOU?

There are many individuals and organisations contributing publications to improve our knowledge and understanding about regional natural resources. If we have missed you, the SAAL NRM Board thanks you for your contribution to natural resource management in the region and invites you to contact Natural Resources SA Arid Lands by 30 August 2014 to tell us about your 2013-14 publications. Email SAAridlands@sa.gov.au or phone 8648 5300.

OUR COMMUNITY

AECOM 2013 *Supporting evidence-based adaptation decision-making in South Australia: a synthesis of climate change adaptation research*. National Climate Change Adaptation Research Facility, Gold Coast, 144 pp.

Hanson-Easey SBP, Hansen A, Williams S, Nitschke M, Saniotis A, Zhang Y and Hodgetts K 2013 *Public understanding of climate change and adaptation in South Australia*. National Climate Change Adaptation Research Facility, Gold Coast, 89 pp.

Maru YT, Chewings V and Sparrow A 2012 *Climate change adaptation, energy futures and carbon economies in remote Australia: a review of the current literature, research and policy*, CRC-REP Working Paper CW005. Ninti One Limited, Alice Springs.

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Desert Channels Queensland 2013 *South Australia Lake Eyre Basin Feral Pig Management Plan*. South Australian Arid Lands Natural Resources Management Board, Port Augusta.

Environment Protection Authority 2013 *State of the Environment South Australia*. Environment Protection Authority, Adelaide.

Natural Resources SA Arid Lands 2013 *Everybody's Land: a strategy for Aboriginal partnerships in the SA Arid Lands Natural Resources Management Region*. South Australian Arid Lands Natural Resources Management Board, Port Augusta.

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- Gibbs M, Alcoe D and Green G 2012 Impacts of Climate Change on Water Resources Phase 3, Volume 4: South Australian Arid Lands Natural Resources Management Region, Technical Report 2013/06. Department of Environment, Water and Natural Resources, Adelaide.
- Gillen JS and Reid JRW 2013 *Vegetation and soil assessment of selected waterholes of the main and northwest channels of Cooper Creek, South Australia, April-May 2012*. A report by the Australian National University to the South Australian Arid Lands Natural Resources Management Board, Port Augusta.
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- Green G, White M, Gotch T and Scholz G 2013 *Allocating Water and Maintaining Springs in the Great Artesian Basin, Volume VI: Risk Assessment Process for Evaluating Water Use Impacts on the Great Artesian Basin Springs*. National Water Commission, Canberra.
- James CS, Van Der Wal J, Capon SJ, Hodgson L, Waltham N, Ward DP, Anderson BJ and Pearson RG 2013 *Identifying climate refuges for freshwater biodiversity across Australia*. National Climate Change Adaptation Research Facility, Gold Coast, 424 pp.
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- Kerezsy A, Balcombe SR, Tischler M and Arthington AH 2013 Fish movement strategies in an ephemeral river in the Simpson Desert Australia. *Austral Ecology* 38: 798-808.
- Lee G 2013 *Landscape assessment and analysis of the Cooper Creek Catchment (SA Section)*. A report by the University of Melbourne to the South Australian Arid Lands Natural Resources Management Board, Port Augusta.
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- National Water Commission 2013 *Allocating Water and Maintaining Springs in the Great Artesian Basin, Volume VII: Summary of Findings for Natural Resource Management of the Western Great Artesian Basin*. National Water Commission, Canberra.
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- Wohling D, Keppel M, Fulton S, Costar A, Sampson L and Berens V 2013 Australian Government Initiative on Coal Seam Gas and Large Coal Mining – Arckaringa Basin and Pedirka Basin Groundwater Assessment Projects, DEWNR Technical Report 2013/11. Department of Environment, Water and Natural Resources, Adelaide.

COMMUNICATION PRODUCTS

- Barker J (ed) 2012 *Across the Outback – August 2012*. South Australian Government, Port Augusta.
- Barker J (ed) 2012 *Across the Outback – October 2012*. South Australian Government, Port Augusta.
- Barker J (ed) 2013 *Across the Outback – February 2013*. South Australian Government, Port Augusta.
- Barker J (ed) 2013 *Across the Outback – April 2013*. South Australian Government, Port Augusta.
- Barker J (ed) 2013 *Across the Outback – June 2013*. South Australian Government, Port Augusta.
- Barker J and Watts J (eds) 2012 *On Track: delivering natural resource management in the SA Arid Lands 2011-12*. South Australian Arid Lands Natural Resources Management Board, Port Augusta.
- Bestprac 2013 *Case study – business diversification in the rangelands, Rawnsley Park*. South Australian Arid Lands Natural Resources Management Board and Rural Directions, Port Augusta.
- Bestprac 2013 *Case study – tackling erosion at Willow Springs*. South Australian Arid Lands Natural Resources Management Board and Rural Directions, Port Augusta.
- Bestprac 2013 *Case study – looking at Wirrealpa with new eyes*. South Australian Arid Lands Natural Resources Management Board and Rural Directions, Port Augusta.
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- Biosecurity SA 2013 *Weed control handbook for declared plants in South Australia*. South Australian Government, Adelaide.
- Edmunds L 2013 *Working with volunteers: advice for land managers in the South Australian Arid Lands*. South Australian Arid Lands Natural Resources Management Board, Port Augusta.
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Our finances

Through the activities of the SAAL NRM Board your community is supported in the sustainable use of its natural resources and in maintaining its natural ecosystems. You and your community benefit from:

- improved care of sites and areas of environmental and cultural significance
- programs that help protect valuable ground and surface waters; support industries to operate sustainably; improve pastoral land management; conserve natural ecosystems; and encourage community participation
- improved partnerships and integration with regional community groups as well as peak body non-government organisations (NGOs)
- support for township economies including maintaining industries, water supplies and tourism opportunities
- monitoring and control of pest animals and plants both for industry and for biodiversity
- support to community groups involved in the sustainable management of the region's natural resources
- a coordinated and integrated approach to managing the natural resources in the SA Arid Lands region to 2020.

These benefits require an investment of funds and the SAAL NRM Board derives its income through four main sources:

- State recurrent funding
- Commonwealth funding
- An NRM levy
- Industry and other opportunistic funds

2012-13 INCOME

Carry-over funds	\$2,714,000
NRM levies	
Regional NRM Levy (inside council)	\$97,000
Regional NRM Levy (outside council)	\$172,000
NRM Water Levy	\$715,000
State Funding	
State recurrent allocation	\$1,020,000
State other	\$171,000
Payroll tax refund	\$19,000
Australian Government	
Caring for Our Country – base funding	\$2,154,000
Caring for Our Country – competitive	\$160,000
Other Australian Government funding	\$217,000
Industry partnerships program	\$274,000
Other sources	\$85,000
Interest	\$94,000
TOTAL INCOME	\$7,892,000
Carryover to 2013-14	\$2,132,000

2012-13 EXPENDITURE

EXPENDITURE AREA	
Active Communities	\$722,000
Functioning Ecosystems	\$1,145,000
Sustainable use – water	\$778,000
Sustainable use – land	\$2,082,000
Support to groups	\$117,000
Board governance, monitoring, communications & administration	\$916,000
TOTAL EXPENDITURE	\$5,760,000



Pelicans on the Diamantina River

PAUL WAINWRIGHT

THE NRM LEVY

WHAT IS THE NRM LEVY?

The *Natural Resources Management Act 2004* provides for a regional (land-based) NRM levy and a NRM water levy to provide additional funding for the Board to take care of our natural resources for future generations.

WHO PAYS THE NRM LEVY?

All landowners (including pastoral lessees) in the SA Arid Lands region pay the regional NRM levy. The NRM water levy is payable on water allocated to the mining, energy, gas and petroleum sector (collectively called industrial licences), for town water suppliers, irrigators and for commercial operations such as tourist park operators in the Far North Prescribed Wells Area. The NRM water levy is not payable on water licences held for stock and domestic use.

WHO COLLECTS THE NRM LEVY?

Local councils collect the regional (land-based) NRM levy annually from their ratepayers and forward the collected funds to the Board. The levy is shown separately on council rates notices.

The Department of Environment, Water and Natural Resources collects the regional NRM levy from outside council areas, and also collects the NRM water levy from water licence holders.

HOW IS THE NRM LEVY SPENT?

The regional (land-based) NRM levy and NRM water levy contribute less than 20 per cent of the Board's total budget and are critical for leveraging extra funds from other sources including State and Australian Governments. The Board also actively promotes other partnerships (eg with industry) to secure additional funding for natural resource management. The Board applies these investments wisely to carry out the work, showcased in *On Track*, that it believes is necessary to achieve sustainability of the region's natural resources.

WHAT ACTIVITIES WOULD YOU LIKE TO SEE FUNDED?

The Board's three-year Business Plan – part of the wider 10-year *SAAL Regional NRM Plan* – is reviewed tri-annually under the *Natural Resources Management Act 2004*.

Public meetings are held throughout the region to gather feedback on how the Board plans to generate and invest its income over the following three years. These meetings are a terrific opportunity to meet with Board members and comment on how the Board plans to raise and invest its income and about natural resource management issues in general.

Flinders Ranges National Park

Our performance

'Our performance' shows how the SA Arid Lands region is tracking against the 50 1-5 year Management Action Targets (MATs) that contribute to achieving the 10-year Resource Condition Targets (RCTs) and, ultimately, the longer term goals identified in the *SAAL Regional NRM Plan*. It is important to note that these targets are contributed to by the actions of all those operating in the region, including all levels of government, industry organisations, land managers, and community members.

MANAGEMENT ACTION TARGET	STATUS
1 Develop register of priority significant sites and policies for management and protection by 2014 and implement on-ground protection by 2016	
2 Review and ensure adequate resourcing for the Pastoral Assessment Program by 2014	
3 Ensure that 100% of land managers have sufficient information to incorporate biodiversity stewardship into enterprise decision-making by 2014	
4 Revise methodology and format of land management plans for the installation of new water points by 2013	
5 Develop best practice guidelines and related extension programs for sustainable grazing management by 2014	
6 Ensure that at least 50% of pastoralists are engaged in best practice management programs by 2014	
7 Complete pest distribution mapping, determine control priorities, and establish mapping data process by 2014	
8 Develop programs for achieving reductions in the distribution and numbers of identified priority pests by 2014	
9 Ensure pathways for new pest animals and plant incursions are identified and monitored regularly, and a management framework is in place by 2014	
10 Undertake risk assessment processes for climate change by 2015 to identify most vulnerable native species, most advantaged pest species, and other potential implications for natural resource management, including water resources	
11 Ensure all relevant land managers are engaged and supported in pest control programs by 2014	
12 Develop cross boundary protocols and guidelines for pest control by 2014	
13 Identify and implement priority research needs in support of MATs 7 to 12 by 2014	
14 Survey and map regional ecosystems, including environmental water requirements, by 2016	
15 Develop programs to support the management and recovery of 50% of the conservation priorities identified within the SAAL Biodiversity Strategy by 2016	
16 Determine the status and vulnerability of 50% of non-priority species, ecological communities and ecological processes by 2016	
17 Commence research to improve knowledge regarding ecosystem function and services for priority ecosystems by 2014	
18 Enhance the public, private and indigenous protected areas network within 80% of all IBRA subregions by 2017 to improve climate change adaptation capacity	
19 Identify priority GAB springs for protection from total grazing pressure by 2012 and protect 50% of those by 2018	
20 Identify other priority aquatic ecosystems for protection from total grazing pressure by 2014 and protect 50% of those by 2018	
21 Develop a regional action plan for pest animal and plant control in aquatic ecosystems in the SA Arid Lands region by 2014	
22 Ensure that the Water Allocation Plan for the Far North Prescribed Wells Area is being fully implemented by 2014	
23 Ensure that a sustainable program for monitoring and repair of leaking artesian bores is in place by 2014	
24 Complete a management/rehabilitation plan for currently flowing artesian bores by 2012 and implement by 2016	
25 Integrate the policies and actions to sustain the GAB within national policies and actions by 2014	
26 Develop water extraction guidelines for surface water systems by 2014	



- No progress
- Limited progress
- On track
- Complete

MANAGEMENT ACTION TARGET

STATUS

MANAGEMENT ACTION TARGET	STATUS
27 Ensure Water Affecting Activities administrative processes are in place and land managers are aware of their responsibilities by 2011	
28 Review Water Affecting Activities requirements to ensure that they are consistent with the objectives of maintaining natural flow regimes by 2014	
29 Implement protection, management and/or rehabilitation measures in at least 10 priority aquatic ecosystems by 2016	
30 Develop a regional water resources research register, highlighting information gaps, priorities, responsibilities and potential funding sources by 2012	
31 Ensure that high research priorities are being addressed by 2014	
32 Work with Aboriginal people to establish engagement process for involvement in natural resource management by 2013	
33 Develop landscape assessment framework by 2014 and ensure all development and land management standards incorporate ESD principles by 2016	
34 Review the extent and priority of impacts upon natural resources associated with features of cultural importance by 2016	
35 Identify soil erosion priority areas and initiate on-ground management by 2014	
36 Establish consultative arrangements for the assessment of soil conservation implications of proposed new infrastructure by 2012	
37 Develop register of priority infrastructure sites with significant soil disturbance/erosion and initiate on-ground management by 2014	
38 Ensure that 50% of pastoral and other broad-acre land managers are applying best practice measures for dingo and fox control and management by 2014	
39 Establish strategic response protocols regarding over-abundant native species by 2014	
40 Establish process for managing native vegetation clearance offsets by 2014	
41 Develop best practice natural resource management guidelines relating to tourism by 2014	
42 Ensure 50% of tourism operators are accredited for Environmentally Aware Tourism by 2014	
43 Review feasibility of expanded partnerships with regional industry and identify priority areas/issues for partnerships by 2014	
44 Develop a predictive water demand model for the region by 2014	
45 Review policies and practices for management of wastewater by 2014	
46 Ensure that programs are in place to provide up-to-date natural resource management information to all sectors of the community by 2014	
47 Develop a support program to increase the participation of Aboriginal people in projects that link with Aboriginal priorities by 2013	
48 Establish ongoing dialogue with relevant educational bodies and ensure inclusion of regionally relevant natural resource management issues in local school programs by 2014	
49 Review adequacy of current training and skills development programs in natural resource management for community by 2012	
50 Identify any significant barriers to effective natural resource management associated with infrastructure by 2014	

Our Board

Section 25 of the *Natural Resources Management Act 2004* provides for the appointment of the South Australian Arid Lands Natural Resources Management Board. The Board comprises up to nine members appointed by the Governor of South Australia on the recommendation of the Minister for Sustainability, Environment and Conservation.



Janet Brook
Presiding Member



Mark Sutton



Leonard Nutt



Daryl Bell



Catherine
Hollingsworth



Rick Barratt



Murray Tyler



Ross Sawers



Pauline McKenzie



Michael Malavazos
Department for
Manufacturing, Innovation,
Trade, Resources and
Energy



Neil Power
Department of
Environment, Water and
Natural Resources



John Virtue
Primary Industries and
Regions SA

In addition to the appointment of community representatives, there are three non-voting Board members authorised by the Minister to represent the interests of the State



VISIT US

The Natural Resources Centre SA Arid Lands provides a one-stop service where you can access services and information on National Parks and the management of wildlife, land and water

Level 1, 9 Mackay St, Port Augusta
www.naturalresources.sa.gov.au/aridlands
8648 5300

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