

ACROSS THE OUTBACK

Montecollina Bore

Well maintained bores last longer

The SAAL NRM Board would like to remind water users in the SA Arid Lands region who have a bore under their care and control to undertake simple, routine maintenance to reduce risks to water supplies, prevent costly and inconvenient breakdowns, and to meet their legal obligations.

The region's largest water resource is the Great Artesian Basin (GAB) which provides a vital supply of groundwater for the continued operation of our key industries (tourism, pastoral, mining, gas and petroleum) and to meet the needs of our communities and wildlife.

To safeguard the sustainability of the GAB and other groundwater aquifers the *Far North Prescribed Wells Area Water Allocation Plan* was adopted in 2009 after a planning process led by the Board under the *Natural Resources Management Act 2004*.

The Water Allocation Plan provides for responsible, fair and equitable water allocations for all groundwater users and sets out the rules for managing the take and use of this prescribed water.

The Board funded the Department of Environment, Water and Natural Resources to undertake a bore audit in 2013-15.

The review of 289 artesian bores in the Far North Prescribed Wells Area was undertaken to establish a comprehensive picture of the condition of the artesian bores in South Australia.

It highlighted that maintenance needs to improve.

In recent decades, governments, industry and individuals have invested significantly in bore rehabilitation and installing piped reticulation systems to deliver GAB water efficiently.

The GAB Sustainability Initiative has supported water users to install infrastructure – pipes, tanks and troughs – that are the responsibility of the water user to maintain, to protect the investment and to ensure wise water use.

Well maintained bores and efficient water use contribute to maintaining the pressure in the GAB.

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Natural waterpoints (mound springs) rely on good pressure. Mound springs are central to the cultural beliefs and stories of many Aboriginal groups; played a pivotal role in the exploration and settlement of South Australia; and are home to many endemic plants and animals and refuges for native fauna.

So, if you have a bore under your care and control, what are your responsibilities?

It is in the interest of all water users to ensure pressure and flows are sustained to meet current and future industry, community and environmental needs.

If you are responsible for a bore (known as a 'well' in the Natural Resources Management Act 2004) you must ensure that it is properly maintained; this includes the casing, lining, and screen, and the mechanism (if any) to cap the bore.

Maintenance is particularly important for artesian bores, where groundwater is stored under pressure and there is more strain on the infrastructure.

Water licences issued under the *Far North Prescribed Wells Area Water Allocation Plan*, require licensees to reticulate water through closed, water-tight delivery systems. It is also a requirement of the licence that these reticulation systems are well maintained.

As infrastructure deteriorates with age, operation and site conditions, regular maintenance can extend the 'working life' of a bore and reduce the risk of breakdown.

Poor maintenance of headworks is often a precursor to valve, fittings and pipework failure and can in some cases lead to catastrophic failure.

The SAAL NRM Board is keen to work with bore owners in providing them with the 'know how' to maintain their bores. Timely, low cost maintenance will extend the 'working life' of the bore – a clear financial incentive.

SAAL NRM Board, DEWNR, Australian Government

WATER ALLOCATION PLAN – OUR GUIDING OBJECTIVES

In managing water in the region, the Board is guided by seven objectives in the current *Water Allocation Plan*. To:

1. Provide adequate water for existing users
2. Ensure stock and domestic allocation for pastoral leases
3. Ensure petroleum production is not restricted by co-produced water restrictions
4. Maintain natural springs and soaks
5. Provide adequate water supplies for future development
6. Clearly define water supply rights and responsibilities
7. Ensure judicious use of water

You can download a copy here www.naturalresources.sa.gov.au/aridlands

NATIONAL DRIVERS FOR BORE MAINTENANCE

The Great Artesian Basin Strategic Management Plan – a 15 year national plan led by the Australian Government to guide governments and water users on the management of the GAB water resources – has been reviewed and is about to be rewritten. Of the 31 findings, six have relevance to bore and delivery system maintenance:

Finding 2: The Basin is widely recognised as a nationally important water resource. Challenges remain in changing the behaviour of some water users, including those who continue to have free-flowing bores and bore drains.

Finding 4: If the remaining free flowing bores in the Basin – estimated at up to 300 bores – are not rehabilitated, it is likely that there will be ongoing local or regional declines in artesian pressure to the detriment of bore capping efforts elsewhere in the Basin.

Finding 5: To address the large number of remaining free-flowing bores and bore drains that are still to be rehabilitated, as well as ongoing maintenance of existing Basin infrastructure, longer-term funding sources must be found to ensure a financially sustainable approach to recovering artesian pressure and minimising water wastage.

Finding 9: The ongoing uncontrolled discharge of water from groundwater bores into open bore drains impacts on the Basin's environmental health (eg through pest and weed infestations). Ensuring bore discharge enters closed, well-maintained water systems should be a priority for Basin management and bore rehabilitation.

Finding 15: It is important that arrangements are in place to effectively manage overall extraction of Basin water resources, to protect the rights of water users and groundwater-dependent ecosystems.

Finding 16: Across the Basin, there is a lack of long term data on water extractions, usage and sustainability of the system. The lack of water extraction data means we often rely on groundwater models to support policy decisions, which themselves are data poor. Management decision making is therefore undertaken at relatively high risk.

The SAAL NRM Board has been involved in the early stages of the review of the *Great Artesian Basin Strategic Management Plan*. A draft is expected to be out for consultation in 2016.

In the meantime, a copy of the review document *Future Directions for the Management of the Great Artesian Basin* is available at www.environment.gov.au



Representatives of the cross-border Lake Eyre Basin partnership accepting the 2015 Thies International Riverprize



HOW CAN WE HELP YOU?

The SAAL NRM Board has reprinted the *GAB Bore Maintenance Field Guide for Artesian Bores* to give guidance on best practice maintenance of bores and associated pipelines.

Topics covered are well head maintenance and minor repair, pipeline maintenance and repair and common problems to look out for in your reticulation systems.

Those responsible for artesian bores in the Far North Prescribed Wells Area will soon receive a copy of this handbook and the *GAB Well Condition Review Summary Report*.

For any bore(s) under your care and control a report containing an assessment of the condition of the headworks and associated surface infrastructure, together with recommendations on maintenance will also be made available.

For further information on how to maintain the bores on your property, your rights and responsibilities, or to obtain extra copies of the handbook, please contact Natural Resources SA Arid Lands 8648 5300.



GAB WELL MAINTENANCE
FIELD GUIDE FOR ARTESIAN WELLS



LEB partnership wins world's highest river management honour

Australia's Lake Eyre Basin partnership took out the prestigious 2015 Thies International Riverprize in recognition of the unique cross-border alliance of community, government and natural resources management bodies that share responsibility for its health.

The world's highest honour for river management, these awards – in place since 1999 – recognise the river that has achieved outstanding results in management, restoration or protection.

The Lake Eyre Basin partnership was up against just two other finalists – Austria's River Mur and the Jordan River which flows through Jordan, Palestine and Israel.

The winner was announced in front of an international audience of river practitioners at the International Riversymposium in Brisbane in September and Janet Brook (Presiding Member, SA Arid Lands NRM Board) accepted the award on behalf of the partnership.

The \$300,000 prize money comes on top of the \$200,000 the partnership won for the 2014 Australian Riverprize, and will be spent on initiatives that support the sustainable management of this unique catchment.

The LEB partnership will also join with the Okavango River Basin Water Commission in Africa to share experiences in managing two of the great river basins of the world where cultural, economic and environmental values depend fundamentally on river flows.

For further information on the LEB partnership see *Across The Outback* (December 2014) where Janet wrote about the partnership after it was awarded the 2014 Australian Riverprize.

South Australian Arid Lands NRM Board, Desert Channels Queensland, Territory NRM, Lake Eyre Basin Community Advisory Committee and Lake Eyre Basin Scientific Advisory Panel



Innovative 'Spatial Hub' lands in South Australia

Eighteen properties in the SA Arid Lands region are getting a firsthand introduction to the NRM Spatial Information Hub, an exciting initiative that is currently being rolled out across Australia's rangelands to provide land managers with simple online tools for analysing land condition and assisting management decisions.

The tools – which allow the consistent development of comprehensive digital property plans, asset registers, ground cover monitoring, and plans of on-ground works across the rangelands – are underpinned by up-to-date high resolution satellite and time-series satellite imagery going back up to 30 years. Much of this has previously been available at a cost and only to government agencies.

About 120 properties across Australia's rangelands are involved in trialling the technology. Digital mapping of property infrastructure has been completed on pilot properties in Queensland and in New South Wales. Some Northern Territory and Western Australian pastoral properties are also part of the project's future work. Now it's South Australia's turn.

Led by GIS and Farm Planning Specialist Lee Blacklock, property visits commenced in the Marree-Innamincka district in September with additional visits planned to the Eastern and Marla-Oodnadatta districts expected to be completed by December 2015.

These initial visits to 18 'pilot properties' are crucial to testing and providing feedback on The Hub as it develops, with the pilot users receiving a demonstration and evaluation of time-series remote sensing of land condition and productivity, as well as property-specific training to access and use the online system.

After November and when the new version of The Hub software has been released, pilot users will be able to use their additional skills and information to review and value add to their property management practices.

Interstate pilot properties that have been trialling the tools since early 2015 are already seeing advantages in creating digital property management plans; long-term monitoring of ground cover; comparison of land condition with the immediate region and historical records; planning watering points for stock; managing stocking rates around fodder availability; recording infrastructure; identifying paddock designs; and evaluating the impacts of new projects on land condition.

These pilot properties are also citing the benefits to decision making and succession planning of having a central repository of property information which pulls in the latest data.

Once The Hub is being fully utilised on the South Australian properties, some of the pilot users will be asked to share their experiences with other land managers through regional workshops and case studies.

WHAT IS THE NRM SPATIAL HUB?

The NRM Spatial Information Hub is providing rangelands managers – from property managers to NRM bodies – with the online systems, tools, data, and skills to improve productivity, land condition and conservation outcomes at the property, regional and national scales.

Users will gain secure on-line access to spatial data over their land, such as high resolution and innovative time series satellite imagery products, as well as tools to analyse land condition, water access and plan infrastructure. They will also have the ability to capture supporting information in the field, using hand held devices such as GPS and smart phones.

The Hub is a central element of the 15 year blueprint of the national Rangeland NRM Alliance's *Australian Rangelands Initiative*.

Stage 1 of The Hub formally commenced in April 2014 and is funded until March 2016, with plans to take the system into long-term operation in mid-2016.

All infrastructure data (eg internal waterpoints, tracks etc.) for the pilot properties was provided by the SA Government; any updates to this information by the properties are provided back to the SA Government through The Hub. However, specific property planning and management information (eg economic and sales data) is "private and confidential" and access is at the complete discretion of landholders.

Futher information

Visit the NRM Spatial Hub website to access land manager case studies from Queensland and New South Wales and more www.nrmhub.com.au

Australian Government, Meat and Livestock Australia, Rangeland NRM Alliance, Pastoral Board, SAAL NRM Board, DEWNR, Cooperative Research Centre for Spatial Information; and multiple other organisations across Australia





"I think it's important to get as many younger operators as possible to these workshops as a lot of damage has been caused by non-educated operators and often it very expensive to repair"
 (Workshop participant)

Grader workshops help fight soil erosion

Lisa Stevens, Regional Landcare Facilitator

The treatment and prevention of soil erosion in the SA Arid Lands region was given a huge boost this year with the completion of the final round of district-based grader workshops.

Forty-two people – representing 18 pastoral properties, private contractors and council workers from across the region – attended the eight workshops at Mulgathing Station and Nantawarinna in August, and Witchelina, Willow Springs Station, Pernatty Station, Kalkaroo Station, Nilpinna Station and Umoona over April and May.

Delivered with characteristic good humour by soil conservation expert Col Stanton, participants were armed with an easy-to-read booklet that introduced participants to soil erosion types (gully, sheet and wind), impacts, causes, and best practice management.

Col then introduced one of the major causes of erosion – humans and the humble grader. Poor grading of new roads, tracks and fence lines can lower natural ground levels and/or create windrows: long, narrow heaps of soil pushed to the side after grading.

These practises can interfere with the natural spread of water across the landscape, causing water to channel, which in turn leads to gullying and starved vegetation.

Col taught participants some 'swear words' too – V-drains, shooting water and catch drains – all examples of poor grading practice.

As the day continued Col demonstrated practical skills in track design and maintenance, drain location and design as well as grading techniques and maintenance.

Most people had a go on the grader where they learned the importance of setting the blade so that it is sympathetic to the landscape – or 'the angle of the dangle' in Col-speak.

Col encouraged people to 'read' the landscape, asking them to consider which way the ground is sloping and where the water is flowing, to look past the ugly gullying – the symptom – and find the 'pinch point' that caused it, and to mark out where interventions are needed.

And he demonstrated how to fix a gully using backfill from existing windrows to reinstate the natural waterflow.

Thanks to the properties who hosted the workshops.

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

Brendan Reynolds (Willow Springs Station) kindly hosted one of the grader workshops: "I now have to learn the new way of doing things, but my son will learn it and it will be second nature for him."

HERE'S WHAT OUR PARTICIPANTS FOUND USEFUL...

- "How to slow the waterflow on roads and how to stop running water from making channels"
- "The importance of assessing the landscape properly before actually grading"
- "Understanding the importance of 'pinch-points' and of using soil from windrows"
- "Little more confidence in the operation of a grader"
- "How to fix mistakes from the past"





Women's Retreat hailed a success

Lisa Stevens, Regional Landcare Facilitator

In a regional first, about 70 women took on Marree in June for the Women's Retreat, a two-day event where they were able to network, relax and celebrate their influence in natural resources management.

"Women are not only contributors to small township communities and pastoral enterprises, they are often highly skilled professionals who are passionate about the environment and leaders and influencers in their own right," said Janet Brook, SAAL NRM Board Presiding Member, who opened the event.

"Women connected to each other, their communities and the world, are essential to healthy regional populations so that they can continue to thrive and care for the region's precious natural resources."

The packed program offered attendees a chance to explore business diversification opportunities, hear about the latest innovations and technologies in pastoral management and animal health, discover how to awaken entrepreneurial confidence, and dabble in jewellery making, silk scarf painting, and yoga.



Keep an eye on our Facebook page where we will soon share some video footage from the retreat as well as some of the interviews that were filmed.
www.facebook.com/naturalresourcesaarlndlands

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

"Love the whole thing – the workshops were great and it was a good mix of topics – feel like I came away with lots of new ideas but also had the chance to take time out and do yoga and a bit of craft"



"I really enjoyed all my workshops"



"We, as outback women like to consider ourselves resilient, and to a degree we have to be, but there is nothing like an inspirational day to recharge."

THANK YOU!

Big thanks to Jess Bell (Dulkaninna Station), Joanna Gibson (Wilgena Station), Megan Henderson (Mt Vivian/Kokatha Stations) and Ashley White (Cowie Station), the Marree Progress Association, Phil and Maz (Marree Hotel) and Lyle Oldfield (Oasis Café), and to everyone who helped with the retreat.



Are Ampurtas making a comeback?

Reece Pedler, Community Fauna Officer

The recent discovery of the Ampurta (or Crest-tailed Mulgara) in the Strzelecki Desert has demonstrated a massive range expansion for this rare marsupial, which has previously suffered historical declines across inland Australia.

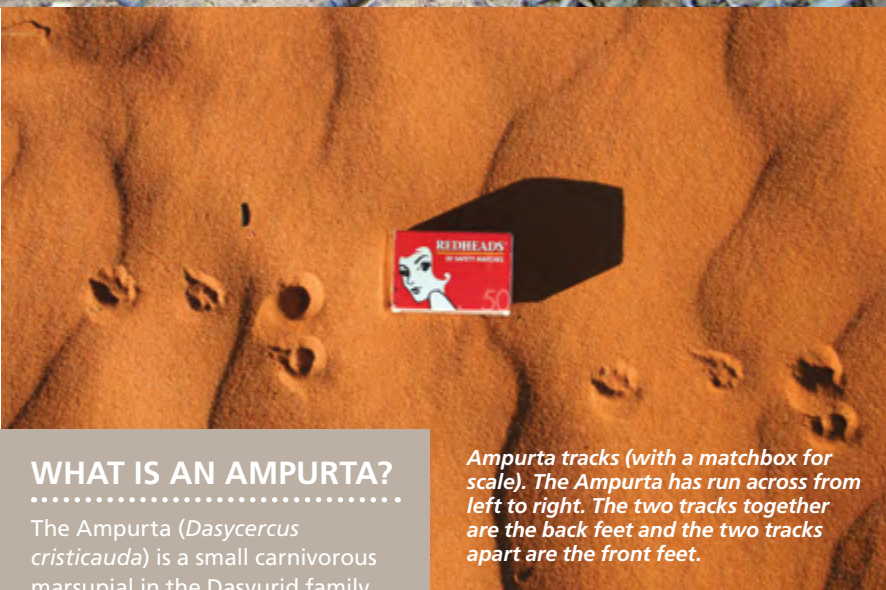
During the 1990s the Ampurta was only known from the Simpson Desert in South Australia, but records over the last 15 years or so have demonstrated a southerly range expansion. During the 2000s it was recorded at new sites outside the Simpson Desert such as west of Lake Eyre and the southern Birdsville Track.

Accordingly it was exciting, but not totally unexpected when the distinctive tracks and burrows of this critter were stumbled upon near Lake Callabonna and at Montecollina Bore on the Strzelecki Track in January this year.

Montecollina Bore was a previous small mammal study site during the 1990s and 2000s with intense study suggesting that the species was not there during that time and has therefore arrived quite recently.

Follow-up surveys across a broader area of the surrounding Cobbler Sandhills and Strzelecki Desert dunefields during July resulted in the capture of several individuals, suggesting that the species has established in a relatively large area of this dunefield habitat, which lies approximately 180 kilometres to the south-east of previous records.

Stay tuned for a future edition of *Across The Outback* where we plan to bring you more on the possible role of rabbit calicivirus (otherwise known as Rabbit Haemorrhagic Disease Virus, RHDV) in triggering the expansion of the Ampurta range along with the range of a number of other small native animals.



WHAT IS AN AMPURTA?

The Ampurta (*Dasyercus cristicauda*) is a small carnivorous marsupial in the Dasyurid family (the same group as larger species such as the Quoll and Tasmanian Devil). Individuals are about the size of a small guinea pig, with a short, fat tail. Their body fur ranges from pale blonde fawn to a rufous brown, with dark black hair along their tail forming a crest-like 'mohawk' near the tip.

What they lack in size, Ampurtas make up for with ferocity, tackling almost any prey smaller than themselves. Their diet consists of a range of large insects and arthropods. They also prey on geckos, skinks, small birds, and even rodents, and will scavenge the carcasses of larger animals such as rabbits.

Ampurta tracks (with a matchbox for scale). The Ampurta has run across from left to right. The two tracks together are the back feet and the two tracks apart are the front feet.

Further information

Like to know more about the Ampurta or have an interesting critter sighting to share? Contact Natural Resources SA Arid Lands Scientific Services team 8648 5300.

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



SA Arid Lands – it's your place

SO WHAT DOES MATTER TO YOU?

Late last year many of the region's community members and visitors took the time to share what they value about the region, in what was the SAAL NRM Board's first step in rewriting the *Regional NRM Plan*.

As you can see from the statistics and map, the Board sent the call far and wide to collect your values and we again extend our thanks.

In the graphic overleaf we have selected a cross-section of community values – these are the things our community told us are important, be they for economic, cultural, social or environmental reasons.

60 workshops,
field days,
property visits,
meetings and
events

Over 600
individuals
reached through
mailout, social
media, website,
meetings and
events

22 verbal and
5 written
responses

79 school
competition
entries

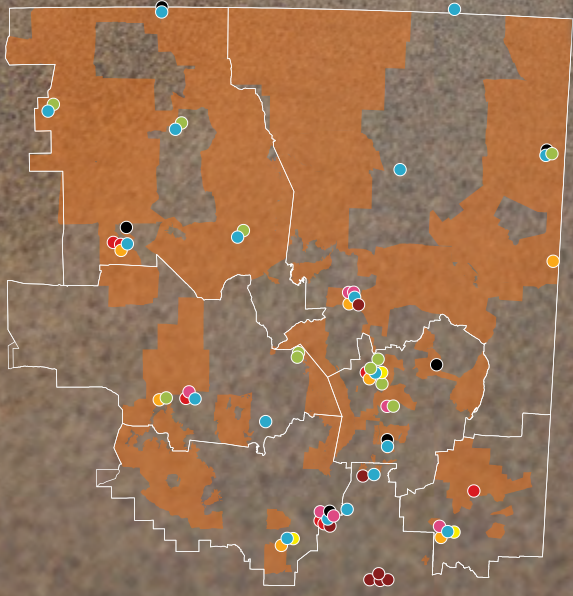
91 properties
participated

7 Facebook
feedback

62
questionnaires
returned

13 online
mapping tool
responses

If you would like to see all
the community values – all 758
rows of them! – and
maps showing the places you
told us you value, visit
[www.naturalresources.sa.gov.au/
aridlands](http://www.naturalresources.sa.gov.au/aridlands)



- LEGEND**
-
 - NRM Districts
 - Engaged properties
 - Meetings/Events
 - Co-management Boards
 - Posters/flyers
 - Town climate workshops
 - NRM Groups
 - Other stakeholders
 - Progress Associations
 - Wild dog workshops
 - Races, field days etc

The data is revealing.

It reminds us that our communities and industries – our lifestyles, livelihoods and landscapes – are all underpinned by access to our natural resources: plants, animals, soils and water.

Our pastoral industry relies on native vegetation and good soils for fodder and water for stock; our tourism industry requires sites for camping, bushwalking, fishing, swimming and bird-watching; and our mining, gas and petroleum industry needs water and access to the region's mineral and gas fields.

In turn, our industries support towns, drive improvements to infrastructure and provide people with jobs.

And our natural resources have also provided for a rich, unique and enduring Aboriginal and European culture with a strong connection to this country.

The data also reveals that our values are often conflicting.

There are those who want no mining in the region, while others want to see mining expanded.

For some, Buffel Grass is a good pasture species while for others it is a terrible threat to biodiversity.

Some see dingoes as apex predators and important totem species and would prefer less control, but others say that dingoes can't co-exist with stock.

Desire for improved infrastructure to increase economic activity for stock, public roads, tourism, freight, tracks and airstrips must trade off against those who enjoy the region for its isolation and 'untouchedness'.

These are all good examples of 'contested' areas where the community holds conflicting values which the Board (and other agencies) must manage.

Channelling limited money and resources into one area means less for another and decisions must be made using a framework that combines community values with the best available science. And that's the Board's next step in its planning process.

Janet Brook
Presiding Member, SAAL NRM Board

ENVIRONMENT

"Beauty and quietness, gorgeous gorges"
"One unified conservation estate"
"Open spaces, big skies and peacefulness"

"Adventure, wilderness, exotic, unusual sites"

"Emu eggs about to hatch"

- Waterholes and catchments • **HEALTHY AND SUSTAINABLE WATER SUPPLIES NOT IMPACTED BY MINING** • Wildlife near ephemeral lakes and waterways
- Coongie Lakes, Simpson, Cooper in flood • Threatened species and habitat • Gawler Ranges east meets west stepping stone
- Lake Torrens to Lake Frome conservation corridor • Gawler Ranges you want to look after • Cat research and eradication
- **CONTROL FERAL ANIMALS** especially in landscapes • **LESS CONTROL OF DINGOES** • Weed control
- **DINGOES AS APEX PREDATOR** • **NO COAL MINES** • Clean, green environment
- **BUFFEL GRASS SPREADING AND OUT-COMPETING NATIVES** • Walking track protection
- Liveable climate • Adventure wilderness

CULTURE/HERITAGE

"The dreaming and creation, the importance of place in Aboriginal culture, song lines and travel"

"Heritage you only see on walking tracks – old shepherds huts and homesteads"

"Bush in my blood"

"Recording cultural heritage and protecting places from interference"

"Hills, caves, rock formations – the animals living there and the many carvings and artefacts"

Balancing your values

THIS IS THE ROLE OF YOUR BOARD AND YOUR PLAN

"Happy, sustainable communities"

SOCIAL/RECREATION

"Volunteers sustaining iconic places"

"Lifestyle – plenty of space"

"Tight-knit community"

"Bringing community together"

"Socialising in shearers quarters or around small campfires"

- People, family, children, community • **CAMPING** • Lookouts • Bush-walking • Affordable housing • All small towns • Connecting with locals
- Bird watching • **BRIDGING DIVIDE BETWEEN LOCAL AND CITY PEOPLE** • Interacting with locals – admire their tenacity
- Fire pit-brings family together • Camp cooking with friends
- Educating next generation on Lake Gairdner • Fishing • Swimming in waterholes
- Helping keep families on the land
- Relationships • Way of living • Taking kids on bushwalks
- Realise there's something more than TV/social media • Lifestyle for children and grandchildren
- Dyland racing • 100% broadband
- Races & gymkhanas • Relationships • Way of living • Taking kids on bushwalks
- Services for local business communities (eg hospitals, mobile network, 100% broadband)

- **BUFFEL GRASS AS A PASTURE** • Invest in marketing for kangaroo, goat, camel meat industry
- **INCREASE CARRYING CAPACITY TO IMPROVE PROPERTY VIABILITY** • Spend \$\$ on bounties rather than on camel management plans
- **IMPROVE SHEEP/CATTLE PRODUCTIVITY** • Seal Strzelecki Track and Leigh Creek to Marree • Conservation tourism – attracts people to area
- **TOURISM TO DIVERSIFY AND DROUGHT-PROOF BUSINESS** • Government activity flowing to local contractors • Bigger rail hub at Ingomar
- **ECONOMIC SURVIVAL** • Living wage • **ECONOMIC GROWTH FROM OIL AND GAS INDUSTRY** • \$\$ for local mining
- **PUBLIC ACCESS – STOCK, PUBLIC ROADS, TOURISM, FREIGHT, TRACKS, AIRSTRIPS TO MAINTAIN/INCREASE ECONOMIC ACTIVITY**

ECONOMIC

"Ability of land to stay productive in the long term, enough to continue to make a living"

"Vast fortune"

"Responsible tourism and operators"

"Cattle production into the future"

"Exploration and potential minerals/energy throughout"

"Ability of land to give an income"



So what next?

The SAAL NRM Board is adopting an evidence-based, 'resilience' approach to the development of the *Regional NRM Plan* where community and scientific values are at its core.

A *resilient* landscape can resist, tolerate and recover quickly from a disturbance (such as a fire, flood, human impact) without tipping into a different state.

This new state may be 'undesirable' – meaning it can no longer be used for what it is valued – and restoring the landscape to a 'desirable state' may be expensive or virtually impossible, for example productive soils that become eroded or salinized.

The table below highlights two priority assets (the GAB Springs and Gawler Ranges) where community and scientific values have been identified that may well be antagonistic in terms of management priorities.

The table shows that the GAB Springs are valued economically as water points for cattle and also as key tourism sites but they are also environmentally important as

habitat for plants and animals which rely on constant water pressure. The Gawler Ranges, meanwhile, hold significant cultural value to local Aboriginal people for their rockholes and environmental value as Yellow-footed Rock-wallaby habitat, but they were also identified as holding economic value as goat habitat and for tourism.

Whether these community and scientific values are conflicting or complementary, they will underpin a planning framework which aims to identify a 'desired state' for our high value systems – just what that desired state looks like and how to preserve it is something that we will work through with our community.

Over time, we will be developing conceptual models of these systems reflecting the complex social, cultural, economic and

environmental factors that interact in each context and clearly identifying the threats and pressures that are driving change to these systems (eg climate change, fire, pest plants and animals, tourism impacts etc).

These models can then be used to inform robust conversations with relevant stakeholders to help tease out the most appropriate and acceptable strategies and management interventions.

This will help us focus our efforts on these drivers of change and be more transparent as to why we may invest our limited resources in some activities and not others.

By 2016, we aim to have collated and analysed the information you have provided to us and formulate this into a strategic Regional NRM Plan which provides a clear, community-endorsed framework to guide Board decision-making.

PRIORITY ASSET	PRIMARY VALUE	SECONDARY VALUE	ADDITIONAL INFORMATION	PRIMARY DISTRICT	PRIMARY BIOREGION	SOURCE OF INFORMATION*
GAB Springs	Environmental	Important habitat	Populations of <i>Eriocaulon carsonii</i> rely on constant water pressure	Marla Oodnadatta	Stony Plains	1a, 1c, 6
GAB Springs	Economic	Pastoralism	Water points for cattle	Marla Oodnadatta	Stony Plains	1b, 4
GAB Springs	Economic	Tourism	Heritage features	Marla Oodnadatta	Stony Plains	1b, 7, 9
Gawler Ranges	Environmental	Important habitat	Yellow-footed Rock wallaby habitat	Gawler Ranges	Gawler	1a, 2
Gawler Ranges	Economic	Meat industry	Goats habitat – important for pastoralists	Gawler Ranges	Gawler	1a, 2
Gawler Ranges	Economic	Tourism	Bushwalking, camping	Gawler Ranges	Gawler	1a
Gawler Ranges	Cultural	Aboriginal heritage	Rockholes	Gawler Ranges	Gawler	1e, 5

*Refers to evidence library containing community and scientific values; scientific values were collected from journal articles and reports and internal data.



Thank you!

Our volunteers sure were busy during the cooler months of the year.

Please enjoy this snapshot of the work that some of our groups have been undertaking. We are so very lucky to have such a dedicated group of individuals, many of them from Adelaide, who give of their time and extend their many skills to looking after our region's natural resources and cultural heritage for the benefit of us all. Our volunteers work on both public and private land and are always looking for new members. We encourage you to get involved and explore their websites for more information. We'll bring you news from some of the other volunteer groups in the next edition.

Further information

Contact our Volunteer Coordinator, Natural Resources SA Arid Lands 8648 5300.

■ Janet Brook, Presiding Member, SAAL NRM Board

Friends of Innamincka Reserves

President Kate Buckley was presented the Premiers Certificate of Recognition for Outstanding Volunteer Service during the group's annual working bee. Kate was nominated for bringing a "...new passion and vision which has led to increased group numbers and a diversity of projects. She has also worked with the Innamincka Progress Association to maintain the Innamincka town cemetery and spent countless hours researching local history to determine who may be buried there. This also included a trip to Canberra to trawl through over 150 boxes of archived records from the Australian Inland Mission."



Caught out by the surprise presentation, it was noted that "it is not often Kate is left speechless." Eventually though she found her words: "I was absolutely astounded to receive such a prestigious award...I thank those people who nominated me for this award and am touched that they believed that my contribution to the Friends of The Innamincka Reserves was worthy of this recognition." Well done Kate.

Visit friendsofinnamincka.org.au

Great Tracks Cleanup Crew

The Great Tracks Cleanup Crew were at it again in May and July undertaking their convoy of outback tracks to rid them of rubbish and maintain them for the enjoyment of travellers and residents alike. The procession of trucks and trailers removed a total of 80 tonnes from the Strez to Moomba and back and from Leigh Creek to Oodnadatta and back via the Stuart Highway. Amongst the rubbish was nearly 500 tyres – that's a lot of blow-outs and a reminder to be careful travelling on the region's unsealed roads! Big thank you to the efforts of the volunteers.

Visit www.greattracks.com.au



Friends of Burra Parks

Over at Bimbowrie Conservation Park in the North East Pastoral district volunteers, mainly from Friends of Burra Parks continued their work in August on the Blacksmith's Shop, Coach House and the heritage-listed Explosives Magazine. Using traditional stonemasonry methods to maintain the heritage and integrity of the buildings the group set to work chipping out and replacing old lime mortar, repairing and replacing stone roof works, affixing doors, chipping out around cracks and repairing cracks with traditional lime mortar (inside and outside), and repairing window sills, followed by traditional limewashing (outside only). Anyone interested in joining this group can call the Clare Natural Resources Centre 8841 3400.

Visit www.friendsofparssa.org.au/members-directory/burra-parks





Friends of Mound Springs

The Friends of Mound Springs have been busy supporting the SAAL NRM Board's project to improve management of South Australia's mound springs. Six volunteers visited the Peake Station in June where they delineated the fence-line to exclude livestock around Levi Springs and identified springs for burning trials to mimic traditional Aboriginal practices. In August, 11 volunteers visited the extinct Beresford Hill mound spring, where fossilised evidence of Common Reed (*Phragmites* spp.) was found in the limestone. On the Peake, there are signs that *Phragmites* may be declining naturally in springs that have been protected from grazing since the 1980s, while on Finnis Springs in the vicinity of Hermit Hill, there are indications that *Phragmites* may be impacting on the endangered Salt Pipewort (*Eriocaulon carsonii*). Nearby, on Stuart Creek Station, the Gosse, McLachlan and Fred Springs were found to be in very good condition.

Visit friendsofmoundsprings.org.au



Toyota Landcruiser Club

Toyota Landcruiser Club members lent their muscles to Wilpoorinna Station in August-September in a mighty effort to restore the shearing shed and old hospital building, the latter moved to Wilpoorinna from Farina Station c. 1910. The Toyota Landcruiser Club has played a key role working with pastoral land managers in the north Flinders Ranges to undertake cactus control for the past 10 years and came to the Litchfield's aid when they expressed an interest in having volunteers work at Wilpoorinna, located near Marree. If you're a landholder with a similar project and could treat volunteers to a similar experience check out our *Working With Volunteers* booklet and contact the Natural Resources SA Arid Lands volunteer coordinator 8648 5300.

Visit www.tlccsa.asn.au



Friends of Simpson Desert

Visitors to Dalhousie Springs now have safer access to the water to take a dip after new entry steps and decking were installed at Witjira National Park by the Friends of Simpson Desert. The largest project the group has ever undertaken, the design and materials needed to be culturally and environmentally sensitive, resistant to the strong minerals and heat of the spring water, and light enough for members to manage the installation process. Installation occurred over several days during the group's May working bee. Forecasted wet weather saw the official public opening of the steps by the Witjira Co-management Board cancelled. Not to be deterred, members unofficially opened the steps and decking to the public. The honour of cutting the red ribbon went to David and Dean Moseley who spent some 400 hours cutting and welding the steps. Congratulations to the group, especially Bill Dwyer and the Moseley brothers, for a tremendous effort.

Visit www.friendsofthesimpsondesert.com.au





Arkaba Station: goats just don't add up

Arkaba Station undertook a trial aerial shoot of goats over two days in June, removing 597 goats from their property which is managed for conservation and tourism and has been a part of *Bounceback* for some years. Station owner and new group member Brendon Bevan gave a passionate presentation to the North Flinders NRM Group at their meeting in September about why he believes goats just don't add up. We share his views here.

In order to complement Arkaba's Conservation Management Plan, it was decided that in 2015 we would implement a trial aerial goat cull. This was a conservation initiative in an effort to support the already effective works done through the *Bounceback* program over previous years.

Our efforts are all unashamedly conservation driven and as long as there is a dollar value associated with feral goats, we will never rid the landscape of them. It is time that we all approach the problem of feral goats with a clear and direct approach – absolute eradication.

If one was to get caught up in the average \$60 per goat argument, one should also calculate at what cost and impact to the landscape, and indeed the environment as a whole, this \$60 goat has had.

Let's make some conservative assumptions about feral goats. A feral goat:

- lives for 10 years
- consumes 1.8 kilograms of vegetation per day
- drinks 3.5 litres of water per day

This handful of information does not include the extensive effect of hoof traffic

on what we know to be an exceedingly sensitive soil structure.

A \$60 goat over its 10 years of existence has cost you and the environment 6750 kilograms of limited vegetation and 12,775 litres of scarce water – meaning you just sold nearly seven tonnes of vegetation and almost 13,000 litres of water for \$60.

Our trial aerial shoot took place on June 2015. During the 10 hours of flying/shooting time, we shot every goat sighted – a total of 597 animals. If we apply our previous calculations removing these goats saved 4,029,750 kilograms of vegetation and 7,626,675 litres of water.

It is by looking at these *conservative* figures that we have come to the conclusion that these animals are not worth mustering to sell. Whether you are a pastoralist, an environmentalist or a healthy combination of the two as I know many in the area to be, you and the environment are losing hands down.



SAITC: Randy Larcombe

We cannot afford a short sighted, short term management solution that puts money in our pockets; we need to get rid of these things quickly in an effective and humane manner.

We were delighted to work closely with several neighbouring properties who supported the operation which allowed us greater access to a far bigger area of control.

When we started the aerial cull, I had expected approximately 150 feral goats to be taken over the two days. I was astonished to see the actual numbers. Our on-ground goat control has been consistent over the years, but I was taken aback by the enormous numbers we encountered and the realisation of the impact they are having environmentally.

Simply put, we need to do more and we need to do it consistently.

We have decided to implement three self-funded aerial goat culls per year from 2016. Our aim is to show a significant increase in the general wellbeing of the environment so as to gain support to cast the net even wider so as to eradicate these animals.



A heavily browsed *Eremophila* shrub



A feral goat caught on remote camera

Properties measure goat damage

Trish Mooney (Bounceback Project Officer) & Rob Brandle (Manager Scientific Services)

Four properties in the North Flinders district, each of them participating *Bounceback* properties – Gum Creek Station, Arkaroola Wilderness Sanctuary, Bunkers Conservation Reserve and Yankaninna Station – now have a better understanding of the damage goats and rabbits are causing to shrubs and trees on their properties thanks to a quick survey method for measuring browse.

If present in high numbers, goats can kill or damage long-lived trees and shrubs by halting their growth, producing stunted dwarf plants that never grow above a metre or less in height.

They also occupy the same habitat as Yellow-footed Rock-wallabies, and compete for food, water and shelter.

When these impacts continue over decades, trees and tall shrubs gradually disappear completely or are represented by just a few old plants.

Palatable plants are those most at risk and include sandalwood, quandong, native orange, mulga, dead finish, mintbushes, some of the emu-bushes and the spiny Christmas bush.

If goat numbers have been high for some time, then there will also be impacts on less palatable species as well, like the rock *eremophilas* and *sennas*.

Goats also remove short-lived shrubs like mulla mulla and native tomato bushes, which make it hard for animals like Yellow-footed Rock-wallabies to survive drought, as these are the plants that get them through dry periods.

The surveys were carried out on the four properties with the assistance of volunteers during March-June.

The approach firstly uses plant size and shape to get a snapshot of long term effects and then looks at the extent of chomping on plant tips at the end of summer, when the last season's growth has matured and the effect of recent browsing is clearest.

This provides landholders with a clear understanding of whether current goat control is allowing native vegetation to recover and provides a baseline for future management.

The goat browse method was endorsed by the Yellow Footed Rock Wallaby Preservation Association (YFRWPA) as it provided validation for their own observations:

"The YFRWPA found [the goat browse assessment on the Bunkers Conservation Reserve] of huge value as it was independent, and based on an established evaluation methodology which the YFRWPA membership does not have, even if ongoing subjective observation has indicated that things were improving," said Kaz Herbst.

Bill McIntosh of Gum Creek Station also found the work useful; "This work is important because it highlights the ongoing attrition caused to some of our most important tree and shrub stands, by even low levels of feral goats. A lot of this insidious decline, because it is a gradual process, might otherwise go unnoticed... and negate much of the environmental value in setting aside higher, inaccessible country for conservation purposes."

Interested in learning more about the damage goats and rabbits are causing to plants on your property? Contact Natural Resources SA Arid Lands Bounceback team for more information 8648 5300.

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



NEW CACTUS BOOK AVAILABLE

Land managers cursed with invasive cacti are encouraged to pick up a copy of *Feral opuntoid cacti of Australia*, a new publication by one of Australia's foremost cactus experts Bob Chinnock.

This first section of the two-part book covers the cylindrical stemmed genera *Austrocyllindropuntia*, *Cyllindropuntia* and *Corynopuntia* – this includes species like Devil's Rope, Coral Cactus, Jumping Cholla and Hudson Pear.

It provides an easy means for field identification as well as detailed species descriptions and notes; many colour photos; detailed line drawings and descriptions of the cacti stems, fruit and flowers; information on suitable controls; and occupational health and safety issues. Information on how to collect and prepare pressed specimens; dispersal and biological/chemical control; and a glossary, complete the book.

This book is an essential reference tool for anyone concerned with identifying and eradicating weedy cacti.

The second part, containing the flat stemmed genus *Opuntia* (eg Wheel Cactus and Common Prickly Pear), is currently in preparation.

The 69 page book costs \$25.

Further information
Visit know.ourplants.org/cacti



Outside (north of) Dog Fence

Volunteers deliver dog control at Bollards Lagoon

Members of the Sporting Shooters Association (Conservation & Wildlife Management Branch) visited Grant and Gina Rieck at Bollards Lagoon Station earlier this year to undertake wild dog control.

Located about 150 kilometres south of Innamincka, Bollards Lagoon is an organic property which means its dog control options are largely restricted to shooting. Grant and Gina took up the opportunity after observing more dogs on their property than in previous years.

"[We] were happy to have the shooters here; [they were a] good bunch of blokes [and we] would have them back again," said Gina.

"They [only] shot about six dogs as they were scarce at the time [but] they are probably coming back here in February when the dogs will be coming in to water more frequently."

"Unfortunately it rained just before we arrived and all the dogs had dispersed over a wide area," said Dennis Donovan, whose membership of the Sporting Shooters Association is motivated by a desire to protect Australian native wildlife and control introduced species.

"Very hot summer weather is preferential for shooting dogs as they like to be near water," he said. "I will be taking a team back to Bollards in January/February 2016."

Cordillo Downs Station also used qualified volunteer shooters from the Australian Deer Association on their property in June. As with Bollards Lagoon, Cordillo Downs had limited success with dog control but indicated that they would recommend the group to other properties.

Natural Resources SA Arid Lands is currently providing a travel subsidy to volunteers from the Australian Deer Association and the Sporting Shooters Association (Conservation & Wildlife Management Branch) to undertake wild dog control on pastoral properties outside the Dog Fence. There are funds to continue the program until June 2016. Registrations to have qualified volunteer shooters visit your property can be made via the Wild Dog Management team.

FURTHER INFORMATION
For access to wild dog management services contact the Wild Dog Management Team Chris Havelberg or Emma Spaeth 8648 5300.

Inside (south of) Dog Fence

IN BRIEF...

HAVE YOUR SAY ON LOCAL DOG CONTROL EFFORTS

Local area planning (LAP) workshops commenced in the Kingoonya district in October and are planned for the Gawler Ranges district in December/January. Land managers are strongly encouraged to attend to have their say on wild dog control efforts in their area. This is your opportunity to review existing local area plans, determine the minimum control efforts (baiting, trapping and shooting) for your LAP group members, review storage requirements and bait supply on hand; time dog control activities; standardise bait preparation techniques; and establish reporting requirements for wild dog control inside the Dog Fence.

Meanwhile members of the North Flinders-Marree and North East Pastoral districts now have their local area plans and are reminded to review, sign and return them to the Wild Dog Management Team.

PROFESSIONAL DOGGER

Professional dogger Brian Gill has now assisted 22 properties with wild dog control since mid-February removing 45 wild dogs as well as 47 foxes and 62 cats. He is booked until the end of January but funds are available to June 2016. Contact the Wild Dog Management Team for details.



Trapping workshops continued to be rolled out across the region in September with workshops held at Boolcoomatta in the North East Pastoral district (seen here) and on Mt Vivian Station in the Kingoonya district (see June 2015 Across The Outback for further details)



Further information on the Enhanced Abattoir Surveillance Program is available on the PIRSA website
pir.sa.gov.au/biosecurity/animal_health/sheep

Vaccinate to prevent 'cheesy gland'

Sheep producers in the SA Arid Lands region are being reminded that vaccination is the most important tool in preventing Caseous Lymphadenitis (CLA or 'cheesy gland') with 2014 data from the Enhanced Abattoir Surveillance Program indicating it remains one of the biggest problems in mutton sourced from the Northern/Pastoral region.

Since 2007, the Enhanced Abattoir Surveillance Program has been providing feedback to South Australian sheep farmers when specified diseases and conditions are detected in their sheep at slaughter.

The program – which monitors some 20 diseases/conditions (including arthritis, grass seeds, pleurisy and pneumonia, CLA and sheep measles) – is funded by the sheep industry and currently operates at both SA Thomas Foods International export abattoirs at Murray Bridge and Lobethal.

Under this program, individual properties submitting sheep direct to slaughter receive feedback about any disease or quality issues. This enables sheep producers to make management decisions that can help to maximise their production efficiency and increase profitability.

This can be achieved through a healthier flock on-farm and less trimming/condemnation on the slaughter floor.

A healthier South Australian flock is also paramount in securing trade access to both present and future market opportunities.

In 2014, close to three times the number of mutton were affected with CLA from the Northern/Pastoral region (14%), when compared to all other South Australian regions, and close to three quarters of producers consigned affected lines.

Within these affected lines, one in five carcasses was trimmed for CLA, which is double the level for all other South Australian regions.

Cost to industry

There are a number of costs associated with CLA. On farm, CLA can lead to reduced wool production (up to seven per cent clean fleece weight in the year of infection); weight loss, with chronic infection causing ill-thrift, emaciation and poor reproductive performance; and wool contamination from ruptured abscesses or abscesses cut open at shearing.

At the abattoir, abscesses must be trimmed which can result in a reduced carcass/dressed weight, or carcasses may even be condemned if the infection is generalised and resulted in whole carcass emaciation.

The vaccine

While it will not cure affected sheep of CLA, vaccination is very effective at protecting unaffected sheep and is therefore the most important tool in preventing the disease.

CLA is included in 3-in-1 and 6-in-1 vaccines. In order to be effective this vaccine must be given as an initial course of two injections and then an annual booster.

Lambs should be given their first dose at marking and their second dose 4-6 weeks later (at weaning).

The most effective time to give sheep an annual booster is about 4-6 weeks before shearing (as shearing poses the greatest risk for infection).

Further information

Contact your local veterinarian or livestock consultant to assist in managing conditions detected on your property. Your local PIRSA Animal Health Advisor can also provide some general advice: contact Trent Scholz 8648 5166 or 0427 970 453.



Across the Outback is prepared and edited by the Communications team, Natural Resources SA Arid Lands, a division of the Department of Environment, Water and Natural Resources.

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Comments and suggestions are always welcome.

Please contact jenny.barker@sa.gov.au or 8463 3354

Content for the March edition due COB Friday 12 March 2016



National
Landcare
Programme



Government of
South Australia

Vale Frank Badman

1943-2015

Botanist, birdo, bushman, park ranger, sometimes nomad, and all round jack of all trades Dr Frank Badman sadly passed away in September. Frank spent much of his life in Australia's outback and much of it in South Australia as an itinerant road builder and repairer and later as a resident of Marree and botanist at Olympic Dam.

"Anyone who has spent time with dad will each be able to recall their own memories of stories dad would have told: from breaking in horses, chasing scrub cattle down to how he went into town once to get the exhaust fixed on his ute... but then left with a brand new car," read his son Shane's eulogy.

We share some of those memories forged from several of his close friendships in the region. These – and Shane's eulogy – speak to Frank's colourful life and love of nature and are shared in full at www.naturalresources.sa.gov.au/aridlands

We extend our sympathy to Shane and Frank's wife Evan and thank Sharon and Darryl Bell (Dulkaninna Station) for suggesting we recognise Frank in this edition of *Across The Outback*.

Julie and Rick Mould (formerly Coondambo Station)

I have fond memories of following behind Frank at Coondambo with him randomly identifying plants left right and centre – it was magic, like a living plant book, a bit like a David Attenborough of plants.

Lyn & Gordon Litchfield (Wilpoorinna Station)

We met Frank when he worked on the road going past our front gate for the highways. Frank drove a tip truck. Gordon and I welcomed him at the front gate as newlyweds, where he told us the tree we were standing near on the dusty flat was probably 400 years old.

This immediately grabbed our attention and that Milgee is still Gordon's favourite tree.

Frank...educate[d] [us] on the birds on Wilpoorinna and Mundowdna, an amazing teacher, gifted with a memory for bird calls and classic Latin. Shane had the same eloquent gift for Latin when naming lizards that made his father very proud. We are now passing on the names of plants, birds and lizards to our grandchildren, not in Latin.

Greg Campbell (S Kidman & Co)

Frank's knowledge of the region's botany was most impressive, and even more so when you realise he was entirely self-taught. He confessed to his first love being birds, with several scientific publications as proof. But that as he got older and his eyesight faded somewhat, plants didn't move and were easier to catch. His wonderful contribution to the far north of South Australia was not only immensely practical but also academic. ... Relatively late in life Frank embarked on postgraduate study and completed a very fine PhD. His quiet friendship and deep knowledge of the botany of the north will be sadly missed.

Douglas Lillecrapp (Todmorden Station)

Until getting involved with Frank through the Marla Oodnadatta Soil Conservation Board, I didn't have much of an understanding of the different plants throughout the district let alone their scientific names. I learned a lot about plants from Frank.

Frank and I initiated the development of a herbarium for every pastoral property as well as for the Soil Conservation Boards. The Marla Oodnadatta Soil Conservation Board also commissioned Frank to develop the plant manual *Plants of the Marla Oodnadatta Soil Conservation Board*.

Tony Williams

(Mount Barry Station)

I have fond memories of the first time I met Frank...He arrived at Nilpinna Station...to sink three dams, one of them that is to this day known as Badman's Dam. I had a lot to do with him as I helped him shift his camp...a van, 4WD, dozer and rubber tyre scraper. We camped out with him and helped him weld up the flumings. Frank was an extremely good welder and I was fascinated by his skill.

We would regularly go out and visit Frank, taking him food and the mail. It was quite obvious that he was hanging out for some correspondence from Evan [his wife to be who lived in the Philippines]. He wouldn't talk to us until he had finished reading his letter, then he would make us a cup of tea.

The pastoral industry is a better place as a result of Frank's professional and personal contribution.

John Read (Ecological Horizons)

He was a great source of knowledge for me, personally, and for many others for whom the diversity and fluctuations of desert birds and plants were almost overwhelming. If Frank didn't know, which was rare, he would find out! ... one of the things I admired most about Frank was that you could be assured, down to the number of stamens or the precise locations of his records, that he was reliable...and accurate.