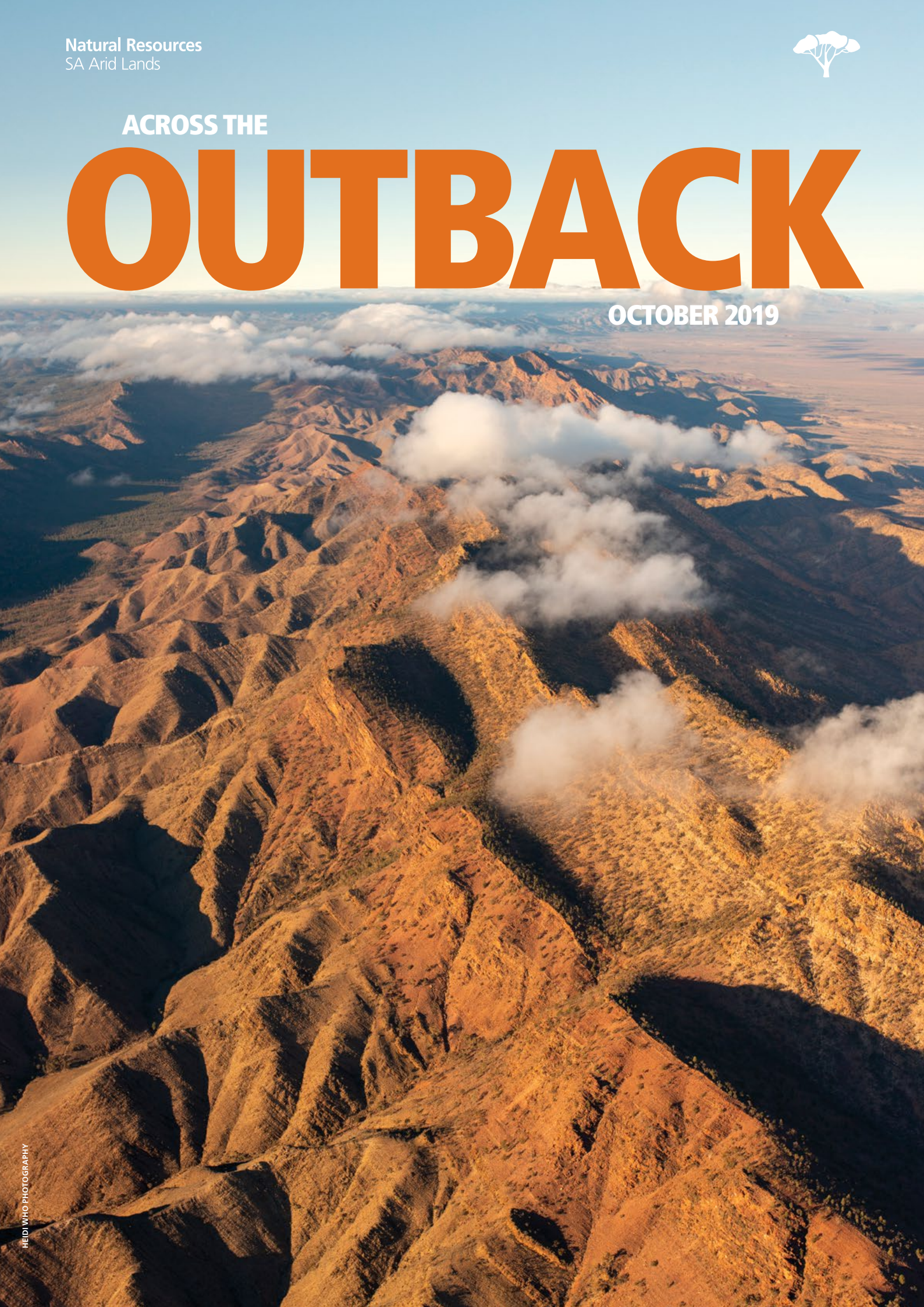
Natural Resources
SA Arid Lands

ACROSS THE OUTBACK

OCTOBER 2019



HEIDI WHO PHOTOGRAPHY

Contents

From the Board

On behalf of myself and the board members finishing their terms I would like to reflect on our time and say a few farewell words.

Our time on the SA Arid Lands NRM Board has been both rewarding and challenging.

The SAAL NRM region is one of the larger NRM regions in Australia, covering more than 50% of South Australia. With a small population the SAAL region has a relatively small levy base to reinvest in NRM over a huge area. As a result, the Board has always been heavily reliant on our community and other partners for their goodwill, and stewardship to assist in achieving the Board's goals.

The NRM model has undergone major changes over the years, through the integration of the NRM Boards with the Department for Environment and Water, and now the introduction of the Landscapes Bill.

Recognising the need to maintain involvement with the community, one of our greatest successes has been the revitalisation, retention and success of the six district NRM Groups. The Board reinstated and has maintained funding for group operations, staff support and activities. The groups are an accurate representation of the community with members from the Aboriginal community, pastoral, mining and conservation sectors. Staff support and Group Project funds remain a Board priority. A shout out needs to go to those who have been, and are, NRM Group members. providing an important two way conduit between the Board and the community.

Wild dog control has long been a high priority for the Board. Recently, we have been able to assign an appropriate level of funding to support this program. There has been much work done which will underpin how wild dogs are controlled in South Australia. Outside of directly funding wild dog control, the Board has worked tirelessly in progressing this issue whilst being mindful of the differing views around wild dog control.

The Board has many statutory obligations under the NRM Act that would not be highly visible to the wider SAAL community.

One major Board responsibility is the requirement to prepare a 10-year strategic NRM plan for the region.

The SAAL Board recently released the second 10-year regional NRM plan. In preparing the plan the Board took an entirely new approach focussing on capturing the things most valued by our community, incorporating them into an adaptive management approach. In doing so the Board consulted widely with the community and its stakeholders and we are very proud of the final product, which will provide the new Landscape Board with a useful framework to work from.

Along with other Board successes the introduction of the Community Grants Program to provide the community with small grants to undertake NRM on ground activities is high among them. The first two rounds were over-subscribed, with the second round of small grants awarded in June. Community grants will be an annual feature of the incoming Landscapes Act, ensuring the Board's program continues.

In closing I'd like to recognise the government representatives who have been a part of our Board and assisted and contributed to our Board at a level well above what was required.

I would also like to thank the long serving Board members who have recently finished their terms – Leonard Nutt, Catherine Hollingsworth, Ross Sawers, Rick Barratt, Malcolm Pridham and Murray Tyler – as well as current board members Mark Sutton, Jan Ferguson, Glenise Coulthard and Ellen Litchfield. Their skills, knowledge, contribution and commitment are to be commended. I could not have taken on the role of chair of the SAAL Board without their support. It is no small undertaking to take on the role of an NRM Board member and it is going to be a difficult task to find individuals to fill their shoes.

Many thanks, Janet Brook
Presiding Member, SA Arid Lands NRM Board

KAREN ENGLISH

Regional Manager update

Welcome to our next edition of *Across the Outback*.

You may be aware the Board and its staff are amid some significant reforms and transitions, so it is timely to update you on what this means for the region, the community and our valued partners in NRM.

The Landscape SA Bill has passed through the Legislative Council and some of the proposed amendments will now be considered in the House of Assembly. Both houses of parliament will need to approve the amendments before the next steps in bringing the new Act to life can occur.

In the meantime, with a hope that 2020 sees the new legislation enacted, each Board across SA has commenced with the potential transition processes towards operating under new administrative and legislative arrangements.

While the Boards continue to collaborate at all levels with the regional structures and offices of the National Parks and Wildlife Service, some adjustments have been made for the NRM Boards. Personnel are now supported by a Regional NRM Manager throughout this period of transition and a level of separation in regional delivery in response to the election promises of Boards operating more autonomously.

The Board staff continue to deliver the work of the Board, maintain the NRM Group support and projects the Board is delivering as a part of the National Landcare Program for the Australian Government.

The investment of your levy into the regional landscape and its use to leverage other investment to support water management, biosecurity needs, biodiversity and conservation remain a priority.

We are working closely with many partners to bring a range of initiatives, services, supports and opportunities to the region. You will read about some of them in this edition or hear about them in due course.

As a community you will notice very few changes at the delivery end of the Board's business.

We have some farewells from our Board of long standing members. These including our long term Presiding Member, Janet Brook, along with Murray Tyler and Rick Barratt, two long serving and committed board members, whose terms all end in November.

I would like to thank them for their wonderful leadership, support and commitment to the staff and the region. It has been a privilege to work with them and be a part of the vision they have for the SA Arid Lands region and its unique and WAPimportant values.

Enjoy this edition of *Across the Outback* and the update on how your levy and Board have been working for you.

Jodie Gregg-Smith
Regional NRM Manager, SA Arid Lands

DRAFT WAP SOON TO BE RELEASED

Drafting of the new Water Allocation Plan (WAP) for the Far North Prescribed Wells Area (FNPWA) is in its final stages and is expected to soon be released for public consultation.

The SA Arid Lands NRM Board committed to the development of a new WAP after undertaking a review of the current plan as is required by the *Natural Resource Management Act 2004*. It agreed to develop a new plan to reflect changes to legislation, emerging water demands, and development of scientific findings.

The draft to be released for consultation will not change the objectives of the WAP and will continue to protect the GAB Springs and maintain the rights of existing licences.

During the consultation phase, all interested groups have the opportunity to comment on and shape the final plan. The start of the consultation phase will be promoted via district Community Landscape Officers, letters posted to stakeholders in the FNPWA, on the SAAL website as well as on its Facebook page. A copy of the draft WAP will be available to download or view online.

It is expected sessions will be held in the region throughout the consultation period at Coober Pedy, Marree and in Adelaide, with dates and times to be advised.

NRM kids

KINGOONYA KIDS DAY

Opportunities to get together don't happen often in remote areas, so when all of the district's children turned out for the Kingoonya Kids Day at North Well Station in July, the Kingoonya NRM Group was thrilled.

Sixteen children from across the Kingoonya and Gawler Ranges districts were inspired with invertebrates by Kris from Bugs n Slugs and wowed with skulls, skins and a live python by the Arid Recovery team.

The children also went on an adventure through salt lakes and sandhills looking for tracks with Clint Taylor on Bon Bon Reserve, a Bush Heritage Australia property.

Thanks to hosts Lynly and Matt Kerin and the families who travelled an average of 158km for their children to take part.

Kingoonya Kids Day

GAWLER RANGES WALK

Tips on plants and animal identification were shared with Cowell Area School students at a workshop held at the Gawler Ranges National Park in September.

Year 4 and 5 students observed the recovery of plant species in response to herbivore management and saw an exclosure containing the rare Gawler Ranges Mintbush, which had been excluded from animal grazing. They were able to compare it with other plants that had been exposed to grazing pressure.

The students also learnt how plants were able to adapt to the harsh conditions experienced in arid settings. One of these was the Yam Daisy that uses tubers to store water and nutrients.

BOUNCEBACK EXPERIENCE

Hawker Area School students had a hands-on experience in April, learning about the Bounceback program and the reintroduction of Western Quolls and possums at Ikara-Flinders Ranges National Park.

They spent a morning with North Flinders Community Landscape Officer Matt Westover walking along the Wilpena Creek looking for signs of rabbit and goat impacts, learning about the impact feral cats and foxes have on native species and how they are managed.

The group then met with ecologists Cat Lynch and Pat Hodgins who showed them how the quoll and possum populations were being monitored, before the students were able to test their skills at radio tracking.

Kids on Country Camp at Hiltaba

KIDS ON COUNTRY CAMP

Six Port Lincoln High School students have a better understanding of the Gawler Ranges landscape after a SA Arid Lands-lead workshop at the Kids on Country Camp at Hiltaba in June.

Gawler Ranges Community Landscape Officer Chris Fulton and SA Arid Lands Community Ecologist Ben McCallum shared information about the area's native and non-native plants and animals.

They took the students on an interactive walking tour which started at the Shearer's Quarters and ended on the rocky outcrops of the hills.

The students observed the changes in the landscape's vegetation as they climbed the hill.

Kids on Country is a collaboration between Aboriginal community leaders, secondary schools, industry partners and Nature Foundation SA staff and volunteers. All share a passion and expertise for increasing the capacity of young people to build on their skills by embedding knowledge of Traditional Owners, Aboriginal connection to country and STEM education.

A macropod exclosure at Boolcoomatta, funded through the Community Grants program, will allow staff to collect data on the impact of kangaroo exclusion on the recovery and persistence of perennial grasses and chenopods in the Open Chenopod Plains habitat

COMMUNITY GRANTS AWARDED

The SA Arid Lands NRM Board has awarded almost $100,000 to 14 projects in the second round of its Community Grants program.

The grant round was very competitive, with 29 applications received totalling more than $200,000.

Recipients received up to $10,000 for projects that included soil conservation works, pest control and biodiversity projects from across the six NRM districts. Grant projects are currently underway and will be completed by June 2020.

Projects funded were:

- Discovering the small ground dwelling fauna of Arkaba (Arkaba Conservancy) $8,820.
- Blinman Cactus control volunteer support project (Blinman Progress Association) $5,000
- Rabbit warren mapping and warren ripping (Bush Heritage, Bon Bon Reserve) $10,000
- Fauna Survey (Coward Springs) $9,664
- Monitoring of Northern Flinders Ranges Springs (Friends of Vulkathunha Gammon Ranges National Park) $2,362
- Enchancing Awareness re GAB Springs in SA (Friends of Mound Springs) $1,945
- Land rehabilitation (Felz Grazing) $10,000
- Iron Knob revegetation (Iron Knob Progress Association) $1,159
- African Rue and Noogoora Burr Project (Merna Mora Station) $3,470
- Soil rehabilitation (Millers Creek – Billa Kalina Pastoral) $9,000
- Management of Mulga Very Low Woodland (Nipapanha Community Aboriginal Corporation) $5,000
- Little Balcoracana Catchment Project (Warren and Barbara Fargher) $9,750
- Algebuckina Waterhole protection (The Peake Station) $9,500
- Macropod exclusion fence (Boolcoomatta Station Reserve) $9,500

Kangaroo impact study in North East

Macropod exclosure fencing at Boolcoomatta Station Reserve is one project awarded a Community Grant by the SA Arid Lands NRM Board.

The exclosure fencing is one step in an ongoing management and research program into the impact of kangaroos in the North Eastern Pastoral region.

While there has been a recent overabundance, knowledge of the impact kangaroos have on the open chenopod plains habitat critical for such threatened species as the critically endangered Plains wanderer, is still to be quantified in this region.

The current project will add to existing infrastructure on Boolcoomatta, which had been established to demonstrate kangaroo impact. However, no exclusion areas existed on the most fragile habitat on the reserve.

The exclosure will allow staff to collect additional data on the effect of kangaroo exclusion on the recovery and persistence of perennial grasses and chenopods. Particularly, research in this area will determine the difference in standing vegetation in accessible and excluded areas, the difference in the composition of seed banks in both areas, the impact of different species and how the soil nutrient level is effected by the exclusion.

A 250m x 250m fenced area will be erected later this year and monitoring will include the installation of a Terrestrial Ecosystem Research Network (TERN) surveillance monitoring plot both inside the proposed exclusion area and a plot outside the area, where kangaroos will be able to access the vegetation. TERN plots are used to identify vegetation species and collect soil samples to assess nutrients and provide the opportunity for future genetic analysis.

Current drought conditions have resulted in large areas of Boolcoomatta Reserve being almost devoid of vegetation, so the exclusion area will allow long-term monitoring of the recovery of this habitat to be directly compared with areas that remain accessible to local kangaroos.

Red meat production in a changing climate

Research has taken Ellen Litchfield all over the world to study the effects of a changing climate in relation to red meat production and her findings have the potential to benefit pastoralists throughout the region.

Currently working on a Nuffield Scholarship alongside her Masters in Sustainable Agriculture, Ellen is passionate about bridging the knowledge gap between leading research institutions, producers and industry bodies on the effects of climate change, and delivering solutions for a stronger, more sustainable red meat sector.

A recently completed study tour took Ellen to Kenya, South Africa, China, Germany, Ireland, America and Canada. While they are a long way from her home at Wilpoorinna Station near Marree, the livestock industry faces similar challenges across the globe.

Through Ellen's research topic: *The impact of climate change on red meat production and profitability in arid and semi-arid rangelands*, she hopes to focus on key priority areas such as consumer confidence, managing climate risk and natural capital.

Now that she is home, we asked Ellen some questions about her study topic.

Tell us about your Nuffield Scholarship and what interested you in applying?

The Nuffield scholarship is an International agricultural scholarship that aims to help people investigate innovative ways to make primary production systems more sustainable. It is also a fantastic network that allows you to gain access to like-minded individuals, this is one of the reasons I applied. I have already met so many amazing people that I know I will always be able to discuss things with and that is very inspiring.

Are there similarities or differences to the way red meat producers operate in the SA Arid Lands compared with the other countries you've visited as part of the Nuffield Scholarship?

Agriculture is a similar industry across the world. I have met people that are extremely passionate about what they are doing and it is truly a lifestyle, not just a profession. Declining terms of trade and the high-risk nature of the business means it requires hard-working and enthusiastic people that are constantly evolving. Challenges are similar across the globe; labour shortages, social license concerns and maintaining a natural resource base.

What do you see are the challenges for red meat producers in the SA Arid Lands region in regards to a changing climate?

The SA Arid Lands region is already one of, or I would argue, the most 'riskiest' environments for livestock production in the world. Australia is known for its boom and bust cycles and nowhere is that more felt than in the SA Arid Lands region. With climate change impacts there will be an increase in the severity of droughts and rain events making it an even more challenging environment.

What are some of the opportunities for innovations that you have seen which can create a sustainable future for producers in our region?

I think the opportunity lies in the recognition of the environmental stewardship role that pastoralists play in our region. It is so unique that we are able to produce a nutritious protein source whilst enriching the natural habitats and biodiversity. Livestock production is getting a lot of pressure from society for its environmental footprint and we need to work on telling our story of production within a sustainable natural resource base. I think people are willing to pay a premium for a product they trust and is having a positive impact on their ecosystem.

How do you hope to apply what you have learnt to the SA Arid Lands Region?

It is an opportune time to be trying to adapt the region to being more resilient to the changing environment with the review of the Pastoral Act. I hope we are able to get recognition for the ecosystem services that pastoralists are doing. We also need to share this story with the greater public.

Wilpoorinna Station might a world away from the countries Ellen visited, but she found that pastoralists are facing similar issues across the globe

Recent study tours to Kenya, South Africa, China, Germany, Ireland, America and Canada are part of Ellen's Nuffield Scholarship

Pest control success

Camera based monitoring completed as part of the *Bounceback and Beyond* project has shown a very high level of control of foxes from baited areas. This included aerial baiting in August 2018 and February 2019, supplemented by wild dog baiting along tracks and roads during November 2018 and May 2019.

Coordinated landscape-scale feral animal control has been at the heart of the *Bounceback and Beyond* program and the long running *Bounceback* program since the 1990s. The major focus has been on fox and goat control to protect those plants and animals unique to the Flinders, Olary and Gawler Ranges.

Fox control during 2018/19 covered 839,800ha of land across 18 privately owned properties (40 per cent of the area) and eight publicly managed parks and reserves (60 per cent). This is an area almost double the size of Kangaroo Island.

Half of the 18 privately managed properties are livestock producers, with the remaining nine dedicated to conservation, tourism or both.

Reinvasion by foxes from adjacent unbaited areas is occasional and very short lived, with no pup production evident in managed areas. This has positive consequences not only for wildlife targeted by foxes, but also for sheep producers who don't have incursions of foxes from adjacent baited areas during lambing seasons.

Goat control across the districts follows a coordinated three step approach. Firstly mustering takes place in the more accessible areas. It is followed by ground shooting, mostly by volunteers from the Wildlife and Conservation Branch of the Sporting Shooters Association of Australia. The last step in the process is an annual helicopter shoot, which is focussed on removing goats from the more inaccessible parts of the ranges.

In the Gawler Ranges, where vegetation cover reduces the effectiveness of helicopter based culling, an increase in ground shooting takes place.

These activities have reduced the amount of degradation that occurs on the higher ranges and has enabled many shrubs and trees targeted by goats to regenerate and multiply.

The *Bounceback and Beyond* program is supported by the SA Arid Lands NRM Board, through funding from the Australian Government's National Landcare program.

Vegetation in the Gawler Ranges

A population of the regionally critically endangered Freckled Duck (*Xerothamnella parviflora*) plant was recently found at a site east of Copley

Threatened plants recorded in new locations

The discovery of several large populations of the regionally critically endangered Freckled Duck plant (*Xerothamnella parvifolia*) in the Gammon Ranges is among the highlights experienced with target plant species in the Board's *Bounceback and Beyond* program in 2018/19.

The finding, by SA Arid Lands Community Ecologist Ben McCallum and DEW Principal Rangelands Ecologist Rob Brandle, comprises a population of about 1500 plants at 10 different sites, stretching over one kilometre at a site east of Copley.

Significantly, the plant only occurs at a site very localised in South Australia with the closest populations believed to be in Queensland and New South Wales.

Many of the plants found were showing moderate to heavy signs of being impacted by herbivores such as goats, sheep and kangaroos. However, inside a 900-square-metre exclosure built by Nantawarrina Indigenous Protected Area (IPA) staff, plants were found to be more structurally intact with a better chance of reproducing. A continued partnership with the Nantawarrina IPA Rangers will ensure these populations will be kept under close check into the future.

The field trip where ecologists uncovered these plants was one of eight monitoring trips in 2018/19, two of which allowed for camera placement where 240 monitoring cameras were deployed. The remaining six field trips included herbivore impact assessment in the Flinders, Olary and Gammon Ranges, with 67 monitoring sites now set up on private land and in areas of National Parks.

Cameras have also been placed at 20 sites known for their high herbivore impacts in areas where Yellow-footed Rock-wallabies are found.

Two trips to the Olary Ranges in February and March also uncovered five new locations of Slender Bell-fruit (*Codonocaprus pyramidalis*) on Bimbowrie Conservation Park, Mount Victor Station and Weekaroo, along with several new locations of Purplewood Wattle (*Acacia carneorum*).

Four trips to the Gammon Ranges uncovered several new populations of Slender Bell-fruit (*Codonocarpus pyramidalis*), with one population consisting of more than 300 plants covering about 50 hectares on Yankaninna Station. Most of the populations were intact with minimal browse.

One trip to the Bunker Ranges in the Flinders Ranges to train volunteers in the monitoring of grasslands revealed that, despite the dry conditions, there are still intact grass butts which is indicative of the relief from herbivore pressures as part of ongoing management of pest herbivores by the Yellow Footed Rock Wallaby Preservation Association.

OUR PERFORMANCE

In 2018/19 as part of the *Bounceback and Beyond* Program:

- 8 field monitoring trips
- 260 cameras deployed
- 67 monitoring sites established
- 19 new populations of focus plant species recorded

Extended drought conditions have left a mark on many of the highly palatable threatened species used to indicate herbivore impact browse and intensity. Desert Mintbush (*Prostanthera striatiflora*) has been the hardest hit with many plants severely desiccated, dead or dying. Also observed were a high number of borers in the Slender Bell-fruit causing limb breakage, which coincides with the areas of vegetation with high die back.

Overall, browse form of palatable plants is good. Treatments sites in national parks had 49 per cent of plants intact, compared to 42 per cent at control sites off park. With increased landscape scale management it is expected that the percentage of intact plants will increase on and off park in future.

Freckled Duck (*Xerothamnella parviflora*), Slender Bell-fruit (*Codonocaprus pyramidalis*), Ooldea Guinea-flower (*Hibbertia crispula*), Spidery Wattle (*Acacia araneosa*), Purplewood Wattle (*Acacia carneorum*) are target plant species in the Bounceback and Beyond program, which is supported by the SA Arid Lands NRM Board through funding from the Australian Government's National Landcare program.

Quolls thrive despite dry conditions

Populations of the Western Quoll (Idnya) and Brushtail Possum (Virlda) have shown their resilience, weathering two of the driest and most extreme years recorded for the region.

In trapping undertaken in April 2019, a fall in population was expected, however the reintroduced quolls and possums defied expectations.

Fifty western quolls, including 29 new individuals and 28 possums (including eight new individuals) were captured. This was the highest number of possums captured during a trapping event, while the quoll numbers were close to the record of 58 caught in March 2017. The captured animals were in good health and were an even mix of males and females. The reintroduction of the animals to the park is part of the long-running Department for Environment and Water's (DEW) *Bounceback* program, and has been supported by Foundation for Australia's Most Endangered Species (FAME).

Monitoring of quolls and possums is conducted using a combination of camera trapping and cage trapping, with traps placed at 182 sites across Ikara-Flinders Ranges National Park over five consecutive nights. New individuals were fitted with a unique microchip enabling them to be tracked over time. Data on the weight, body condition, foot and head length and reproductive status of individuals were also captured.

The Australian-government funded *Bounceback and Beyond* project extends the footprint of the *Bounceback* program and aims to significantly expand the positive impacts by undertaking management and monitoring activities beyond the area covered by the DEW program.

Activities supported through the *Bounceback and Beyond* project include monitoring of the quolls and possums in conjunction with activities supporting growth and expansion of their populations. This project is supported by the SA Arid Lands NRM Board, through funding from the Australian Government's National Landcare Program.

Idnya (Western Quoll)

Virlda (Brushtail Possum)

OUR PERFORMANCE

In 2018/19 as part of the *Bounceback and Beyond* Program:

- 3 Monitoring surveys conducted (Western Quoll, Xerothamnella and Flinders Ranges Purple-spotted Gudgeon)
- 2 Baseline surveys of pest animals completed

Australian Government | National Landcare Program

REECE PEDLER

AMPURTA OR CREST-TAILED MULGARA

The Ampurta or Crest-tailed Mulgara (*Dasycercus cristicaudata*) is a carnivorous marsupial found in arid sandy areas of South Australia, Northern Territory and Queensland. They are about the size of a small guinea pig, have sandy coloured fur and a crest of black hairs along the top of their short, fat tail. Ampurtas live in small burrows where they shelter during the day, emerging at night to capture their prey which includes a range of invertebrates, small reptiles, small birds and other small mammals.

Plotting to find native animals

Natural Resources SA Arid Lands staff have been trekking across sand dunes in the far north-east of the state, using their skills in track identification to look for signs of threatened species such as Ampurta and Dusky Hopping-mice.

Their survey work is using the two hectare track plot methodology, which has previously been used as a tool to monitor the distribution and relative abundance of threatened small mammals, plus associated predators and herbivores.

Successive surveys across the SA Arid Lands region have established about 350 two hectare track plots in the past few years. More recently, as part of the *Coongie Wetland Wonders* project more than 75 additional plots have been surveyed in new areas.

Like many other native mammals, numbers of Ampurta and Dusky Hopping-mice have declined greatly since European settlement, particularly due to predation by feral cats and foxes, as well as competition for resources with rabbits. Other threats to the species include habitat loss and degradation.

Although current conditions are very dry, some signs (tracks, scats or burrows) of Ampurta and Dusky Hopping-mice were found across the project area. The recent surveys have helped to improve the understanding of the area of occupancy of these species and further surveys will be undertaken over the next four years to further build on ecologists understanding of these species and their threats.

The *Coongie Wetland Wonders* project is supported by the SA Arid Lands NRM Board, through funding from the Australian Government's National Landcare Program. It would not be possible without the support of landholders and volunteers who contributed to the study and supported the field surveys.

REECE PEDLER

DUSKY HOPPING-MICE

Dusky Hopping-mice (*Notomys fuscus*) are also found in sandy areas of northern South Australia and adjoining states. They have long hind feet, large ears, dark eyes and a tufted tail end. Also nocturnal, they live in small groups in burrows with a series of entrances leading to chambers and tunnels up to one metre below the surface. Dusky Hopping-mice inhabit sandy habitats with perennial vegetation, and their diet consists mainly of plant material and occasionally insects.

OUR PERFORMANCE

In 2018/19 as part of the *Coongie Wetlands Wonders* Program:

- Pest animal control covered 357,743ha
- Weed control was conducted over 5,100ha
- Dusky hopping-mice, crest-tailed mulgara, night parrot and fish diversity were the subject of 4 fauna surveys
- Three baseline monitoring regimes were implemented for pig and large feral herbivore impacts, as well as vegetation responses to hydrology

CHRIS HIGGINS

Successful pitting in ironstone country

Geomorphology: what it is and how it can be applied

Rangelands geomorphologist Dr Gresley Wakelin-King has worked with landholders, hosting short courses in Leigh Creek, Marree and Kingoonya as part of the Landscape Legacies program.

For those who couldn't attend the workshops, Gresley has summarised what geomorphology is and how it can be used to help control water distribution on properties.

Geomorphology is the science of landscape. It considers different landforms and how each works with the others to create habitat. The geomorphology of desert rivers is especially important. Where water is limited, the landforms that control water distribution underpins all ecosystem productivity and sustainability.

Different types of country respond to water in different ways, depending on slope, surface material or catchment size, for example and can't all be managed identically. Think about floodplain habitats in large river systems, where floods come down from high-rainfall upper catchment areas. These will have different requirements for inundation frequency than small creeks reliant on local rainfall.

Geomorphology allows us to look at property-scale relationships of water movement. When rainfall is shed from a rocky hillslope but retained in a red-earth plain, the loamy plain will be more obviously productive; yet water shed from the hillslope may be a critical resource for valley-margin habitat.

The way water moves across country is also important for management actions: a building, road, or rehabilitation technique may work well in one place, yet trigger ongoing erosion elsewhere.

Management actions that work with the landscape's processes can have better outcomes than those that don't.

THE FIRST STEP is to look at the country with an eye towards water movement, find the flow path. Is it a steep or gentle slope? Wide or narrow? What is the vegetation type and abundance? This will indicate what kind of flow energies the landforms and vegetation communities are adapted to.

THE SECOND STEP is to engage in a fit-to-landscape analysis and consider if the proposed works will function well within the landscape or whether there will be unintended consequences.

Stepping through these questions early in the planning process can help landholders prioritise their resources.

LANDSCAPE LEGACIES: PROPERTY CASE STUDIES

Landscape Legacies, a one-year Australian Government-funded program, has shared stories of soil rehabilitation and provided sustainable agriculture advice in geomorphology workshops.

A major component of the program in 2018/19, was the presentation of soil rehabilitation case studies of the Oulnina, Willow Springs, Winnininnie and Wirrealpa properties.

All case studies take an historical look at past works and form stories of successful land management.

WIRREALPA

The Wirrealpa story starts in 1953 when the Fargher family purchased the North Flinders property. At that time it was heavily grazed, had few water points and had carried more than 40,000 sheep.

Early works on the property included the installation of additional water points, pitting of bare land to form soil depressions to trap water and seed, and ripping of rabbit warrens.

Skip forward to 2010 and the property became involved in an SA Arid Lands NRM Board property management project to gain a better understanding of its natural resources and how they could be used sustainably. This included mapping of landforms, drainage, vegetation types, productive capacity and areas of cultural, biodiversity and historical significance onto satellite images.

Landscape ecologists and project staff undertook on-ground inspections to determine sites for land rehabilitation works, focussing on improving the more productive land on the property that would yield better economic returns. As time and finance permitted, banks were built to intercept, slow and divert water flows to allow it to soak into the soil, promoting plant growth and reducing the risk of erosion.

The benefits of these works can be seen on the property today.

Wirrealpa's full story and others are available on our website at www.naturalresources.sa.gov.au/aridlands/land

Your Levy at work

The SAAL Board's Partnerships and Community Engagement Team were busy in 2018/19 hosting a number of events, supporting community events and co-ordinating regular group meetings across the region.

***Across The Outback* returns to print**

GROUP MEETINGS

Thirty one group meetings were held across six districts looking at natural resources management issues across the region.

Three of the groups had new members appointed in June 2019.

GAWLER RANGES was joined by James Kerr from Buckleboo and Brenton French from Corunna. The two men join five existing members of the group. This group is coordinated by Community Landscape Officer Chris Fulton.

MARREE INNAMINCKA NRM Group was bolsted by the addition of Yandruwandha Yawarrawarrka representative Joshua Hayes and pastoralists Craig Oldfield and Lynette Litchfield. The district also has a new Community Landscape Officer Lucy Goldspink, who has moved across from the Kingoonya group.

The **NORTH FLINDERS** NRM Group members were joined by Teresa Brady from Copley and Jonathon Sanders from Nantawarrina. This group is coordinated by Matt Westover, who also is responsible for supporting the **NORTH EAST PASTORAL** Group. Both groups have a full quota of seven members.

MARLA OODNADATTA Group, coordinated by Sarah Stevens has retained its seven members.

KINGOONYA NRM Group has three vacancies and a new Community Landscape Officer, Glen Murray. Glen is new to the SAAL team, having joined the region from the East Kimberley region of WA in September.

The full list of NRM Group members is available on our website at www.naturalresources.sa.gov.au/aridlands/about-us/nrm-board/nrm-district-groups.

KEEPING YOU INFORMED

The Board produced two e-ATO publications and returned to the hard copy ATO newsletter in April this year. It was the first hard copy publication in two years and came about after community feedback.

Past editions of the ATO can be viewed under the news and resources tab on our website at www.naturalresources.sa.gov.au/aridlands/news-resources

The Natural Resources SA Arid Lands Facebook page grew by **436** followers during the 18/19 year, increasing from **2,263** people to finish at **2,699**.

During the year, the page had **281** posts, with the most popular being the sharing of photos of water arriving at Lake Eyre. That particular post reached **33,355** people, had **922** comments, likes and shares and **4,821** post clicks.

Other popular posts were:

- Brown snake eating a sand goanna **16,080** reach on 12/12/18
- Simpson Desert summer closure **12,090** reach on 7/12/18
- Floodwaters arriving at Innamincka **8,796** reach on 14/5/19.
- A NAIDOC week walk in the park at Ikara Flinders which reached **8,371** people on 1/7/18
- TAFE SA Pastoral Course opening **7,503** reach on 13/11/18
- Closure of Ikara for feral goat control **6,183** on 6/2/19; and
- 20 year celebrations at Nantawarrina **5,026** reach on 29/8/18

WEBSITE

The SA Arid Lands Website had considerable web traffic throughout 2018/19.

In total, **39,063** visitors accessed **47,309** pages over the year. The most popular pages were consistent across the year and included native plants, native animals, NRM Plan, grants and funding and the Water Allocation Plan.

View our website at www.naturalresources.sa.gov.au/aridlands

EVENTS 2018/19

- Marla Oodnadatta NRM Group Field Day in Coober Pedy **98** people
- Snake Awareness workshops at Andamooka, Roxby Downs, Olympic Dam, Woomera and Bollards Lagoon **327** people, **9** workshops
- Gawler Ranges Drought Relief Comedy Night **66** people
- Marla Oodnadatta No Stress Stock Handling at Mount Barry and Todmorden Stations **31** people, **2** workshops
- Feral Pig Workshop at Martins Well **9** people
- Chemcert Training Day at Yunta **17** people
- NAIDOC event at Ikara-Flinders Ranges **60** people
- Stickybeak Day at Secret Rocks, Gawler Ranges **22** people
- Water movement workshops at Marree, Leigh Creek and Kingoonya **32** people
- Planning sessions in the Kingoonya, North East Pastoral and Marree Innamincka districts **47** people
- Bore maintenance workshop at Commonwealth Hill station **22** people.
- Trained volunteers in processing remote camera data **8** people
- North West Pastoral Field Day – Glendambo, **166** people
- Lesson on the impacts of feral animals and the Flinders re-introduction project with Hawker Area School **10** people
- Partnered with Nature Foundation SA to run activities at Hiltaba for its Kids on Country program **10** people
- Information stalls at Flinders Fest, the Yunta Races and Hawker Sheep Tech and Innovation Day
- Recycled Art Competition in Coober Pedy


Marla Oodnadatta Field Day


Gawler Ranges Comedy Night


North Flinders Feral Pig Workshop


Nantawarrina Weeds Workshop, North Flinders


Kingoonya and Marla-Oodnadatta combined group meeting


Kingoonya Snake Awareness Workshop


Marree Innamincka NRM Group Meeting


Chemcert accreditation at Yunta

Biteback news

Realtime records for wild dogs

SA ARID LANDS NRM BOARD SPRING INJECTION SERVICES

Spring Injection Services are underway across the region with all landholders located inside the dog fence contacted via email.

In the North Flinders District, the services were held from 16-20 September, in the North East Pastoral District on 1-2 October and a future service on 17 October, and services in the Kingoonya and Gawler Ranges Districts from 21-29 October.

For information about these services, contact Wild Dog Project Officer Chris Havelberg on 8648 5962.

An easy to use method of reporting wild dog activity, the Wild Dog Scan smartphone app, is gaining in popularity in the SA Arid Lands.

Used correctly, the application replaces the current paper map system and allows land managers to map wild dog impacts, activity and control efforts in real time.

One landholder that uses the app is Colin Greenfield of Billa Kalina and Millers Creek Stations.

"Wild Dog Scan is great because it shows where control is happening and the numbers recorded," he said.

Colin likes that data can be easily shared with neighbours or Biteback group members to ensure wild dog activity is acted upon quickly and before impacts are experienced.

SA Arid Land NRM's Wild Dog Project Officer Chris Havelberg urged all land managers to use the app as an alternative method of reporting wild dog activity in their region.

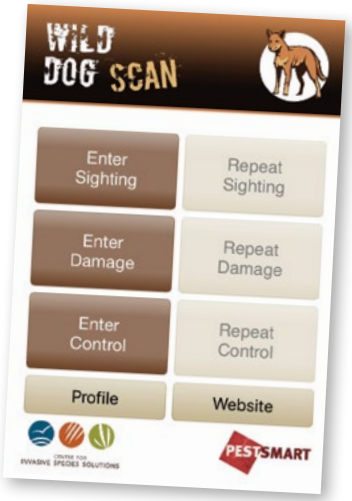
He said its real time benefits provide the best level of service and advice to landholders experiencing issues.

Community Landscape Officer Matt Westover recently completed a training session at Leigh Creek with members of the North Flinders NRM Group and interested landholders.

Attendees at the training session learned how the application works, how to join their allocated groups, how to report wild dog activity and control measures and how to view recorded information on the online map.

If you would like to begin using the Wild Dog Scan application, but need some training to start, please speak to your local Community Landscape Officer or Biteback officer.

The App can be downloaded from the iTunes App Store or on Google Play.



REPORTING (2018 CALENDAR YEAR)

REGION	Maps Returned	Wild Dog Scan Reporting	Properties Shooting	Number Shot	Properties Trapping	Number Trapped	Properties Losing Stock	Number Stock Loss
SAAL (inside dog fence)	57.0 %	5.5 %	19.5 %	324	15.5 %	395	16.5 %	6,195
SAAL (outside dog fence)	17.6 %	5.8 %	19.6 %	908			9.8 %	44

BAITING DATA (2018/19 FINANCIAL YEAR)

BAITING PER DISTRICT (INSIDE THE DOG FENCE)

REGION	North Flinders/ Marree	North East Pastoral	Kingoonya	Gawler Ranges
Properties Ground Baiting	73.7 %	65.3 %	85.7 %	45.8 %
Total Number of Baits	66,075	80,885	61,580	23,665
Meeting Best Practice Baiting Levels	65.3 %	66.0 %	62.1 %	34.7 %
Baiting, but not meeting Best Practice Baiting Levels	9.3 %	4.3 %	20.7 %	10.2 %
Not Baiting	25.3 %	29.8 %	17.2 %	55.1 %

TOTAL BAITING (SAAL REGION)

REGION	SAAL (inside dog fence)	SAAL (outside dog fence)
Properties Ground Baiting	67.0 %	13.7 %
Total Number of Baits	232,205	18,380
Meeting Best Practice Baiting Levels	57.5 %	
Baiting, but not meeting Best Practice Baiting Levels	10.0 %	
Not Baiting	32.5 %	

First step for $25 million Dog Fence rebuild underway

The first step for the $25 million rebuild of the South Australian Dog Fence is now underway with initial procurement information for prospective suppliers and contractors now available.

Minister for Primary Industries and Regional Development Tim Whetstone said the State Government recognises the impact of wild dogs on the livestock industry and the urgency in starting the rebuild process.

"The release of the supply notification is the first step in the procurement process for interested suppliers and contractors to understand the requirements and scale of the rebuild," Minister Whetstone said.

"The information released provides suppliers and contractors with an overview of what will be considered in the merit-based awarding of contracts for this project so they can start to prepare and plan their applications.

"There will be two components of the dog fence rebuild – the supply of materials and the creation of a panel of fencing contractors.

"We are anticipating significant interest in participating in the dog fence rebuild ahead of a call for tenders later this year. The State Government has policies in place to ensure eligible local businesses are given opportunities to benefit from and bid for work on major government projects such as this."

Minister Whetstone said the rebuild, jointly funded by the Commonwealth and State Government and industry, is a one-in-a-generation opportunity to provide a reliable barrier against the incursion of wild dogs in the pastoral areas.

"Drought has exacerbated the impact of wild dogs on South Australia's $4.3 billion livestock industry and it is vital we do everything we can to keep them out of pastoral sheep country and the southern agricultural zone," he said.

"More than two-thirds of the 2,150km South Australian Dog Fence is beyond its serviceable life, that's why we need to get the rebuild right.

"Much of this fence is more than 100 years old and is ageing and brittle and being heavily impacted by large native animals such as kangaroos and emus, feral camels, wild dogs, weather events, sand erosion, rust and corrosion.

"This rebuild will benefit the pastoral community and supporting outback communities through reduced wild dog management costs, employment opportunities and choices about whether they choose to run sheep or cattle."

As part of the overall planning for the project, the State Government has formed the Dog Fence Rebuild Committee (DFRC). Chaired by the PIRSA Deputy Chief Executive Professor Mehdi Doroudi, the committee comprises the following, or their representatives:

- Chairs of the Local Dog Fence boards
- Chair of the Dog Fence Board
- The owner of the north west private section of the Dog Fence
- President of Livestock SA

Professor Doroudi said the committee is engaging with local dog fence boards and other pastoral stakeholders to ensure each section of the new fence is built to best suit the terrain, substrate and pressure from wild dogs in that area.

"Pastoralists are being consulted during the design process. Issues being considered include priority areas, investigating a possible need to change the fence location, earthwork requirements, materials and designs best suited for the different types of terrain the fence traverses, and the best materials and designs for creek crossings and floodways."

Dog Fence Board chair Geoff Power said as part of these considerations the Dog Fence Rebuild Committee conducted a fact finding visit to western Queensland in September, followed by a full inspection of the South Australian Dog Fence.

"Over the last few years there has been a $20 million investment in wild dog exclusion fencing in Queensland and this visit to Barcaldine and Longreach provided the Committee with a good opportunity to learn from their lessons before we commence the South Australian rebuild," he said.

"Not only did we inspect the different types of fencing that have been used in western Queensland, but sought feedback from local pastoralists on the fencing options that have worked best.

"The full inspection of the South Australian Dog Fence was also very important as it will assist in determining, in collaboration with the local Dog Fence boards, the priority locations for fencing works as the project gets underway next year."

Feral herbivore cull in Marla Oodnadatta

A control operation across 500,000ha in the Far North in June 2019 removed 230 feral herbivores.

Held in the Marla Oodnadatta District, the operation was a result of information on feral herbivore numbers by the district's NRM Group.

An issue for both pastoralists and the environment, the large feral herbivores increase total grazing pressure, consume stock water, damage Aboriginal Heritage sites, are a threat to motorists, damage community infrastructure and foul waterholes and drainage lines. Camels are also notorious for wrecking fences which allows stock to escape, or enter protected areas.

Aerial shooting is considered the most efficient and humane means of controlling large feral herbivores across broad inaccessible landscapes and this project helped ease pressure on the environment and pastoral properties resources through their removal.

In all, 25 operational hours were spent on Wintinna, Evelyn Downs, Arckaringa, Anna Creek and The Peake stations at locations identified by land managers.

OUR PERFORMANCE

2018/19 pest animal control

1,288,700 ha controlled for pest animals including:

- 745,900ha fox control across 17 properties
- 380,000ha goat control across 12 properties
- 71,000ha cat control
- 957 large feral herbivores removed from the landscape
- 371 feral pigs removed from the landscape

AUSTRALIA'S FIRST WILD POPULATION OF PINE CONE CACTUS FOUND IN LEIGH CREEK

At the New and Emerging Weeds workshop held in Leigh Creek recently,the first recorded wild population of pine cone cactus in Australia was discovered.

Identified as *Tephrocactus articulatus* syn: *Opuntia articulate* the potentially threatening plant was found on the perimeter of the township. A local resident alerted the North Flinders Community Landscapes Officer Matt Westover to the plant, which was then sighted by State Herbarium Weeds Botanist Chris Brodie and Primary Industries and Regions SA's Newly Established Weeds Facilitator, Biosecurity SA, Shannon Robertson.

Mr Robertson said getting onto a new weed fast helped prevent the spread and was the first step towards eradication.

Being an Opuntioid cacti, this plant is captured within the declaration for the Opuntia genus, under the *Natural Resources Management Act 2004*.

SA Arid Lands staff will now work with the Leigh Creek community on control and eradication of the plant.

If you see this plant or any plant you are unsure about, take a photo that contains distinguishing features like seeds, fruits, flowers and leaves, record the location, and report it to the Natural Resources Centre in Port Augusta on 8648 5300 or email SAAridlands@sa.gov.au.
It can also be reported via the SA Weed Control smartphone app: pir.sa.gov.au/weedcontrol

SA Arid Lands NRM Board staff have started a nursery to breed its own stock of the cactus biocontrol insect cochineal

Nursery trial for cactus control

The success of a biological control for cactus across the region has resulted in the SA Arid Lands NRM Board starting a nursery to breed its own stock of the biocontrol insect, cochineal.

The nursery trial, raising a biotype of cochineal to treat the Jumping cholla cactus (*Cylindropuntia prolifera)* and Hudson pear (*Cylindropuntia pallida)* cactus varieties, started in Port Augusta this winter. It is planned to use the harvested cochineal to transport and place on infestations of Jumping cholla at Arkaroola and Mt Ive and Hudson pear on properties nearer to Port Augusta.

Cochineal (*Dactylopius* spp.) is a scale insect native to the Americas that has been used as bio-control agent in Australia since the 1920s. It was traditionally harvested for its red dye, carmine.

Volunteers in the North Flinders have also been using it to assist with controlling Wheel and Rope cactus infestations.

There are future plans to also breed cochineal suitable for Coral cactus (*Cylindropuntia fulgida* var. *mamillata)*, Engelmann's cactus (*Opuntia engelmannii)* and Prickly pear (*Opuntia stricta)*, with infestations of the latter two both present near Port Augusta. Cochineal for Coral cactus is required further afield on infestations in the North East Pastoral, North Flinders and Marla Oodnadatta districts.

Sustainable Landscapes Project Officer Paul Hodges said he had previously found difficulty in spreading the insect due to the remoteness of infestations across the SA Arid Lands. Cochineal drifts rather than flies and travels less than 100m between plants, meaning it is unable to travel between isolated infestations due to the distances involved.

Cochineal are host specific and aggressive strains can kill all the host plants and then perish as they run out of food, resulting in loss of effective strains of the insect.

"A nursery allows you to maintain these strains of cochineal and provides a ready source to take out into the region," Mr Hodges said. "We're better having a population here and it's a good opportunity to trial biocontrol that we can take with us."

At the nursery, the insects are regularly fed clean plant material. While they are largely dormant over winter, the breeding rate is known to increase dramatically over the summer months.

To discuss options for controlling cactus and other weeds, contact Sustainable Landscapes Project Officer Paul Hodges on 8648 5300, or email paul.hodges@sa.gov.au

OUR PERFORMANCE

2018/19 pest plant control

- New cochineal releases on 4 properties
- Follow-up monitoring on 4 properties
- 3,560 volunteer hours on opuntia control

Sunrise on Etadunna Station

Online biosecurity management program

One Biosecurity is a voluntary on-farm biosecurity management program that helps livestock producers better manage, protect and promote their animal health biosecurity practices and plans online.

Developed with key industry groups, the online One Biosecurity (1B) portal promotes and supports producers to adopt good on-farm biosecurity practices and risk management.

Offered by Primary Industries and Regions SA, 1B can help develop great resilience and flexibility to meet the demands and challenges of changing markets and potential disease threats. Among its advantages are the ability to create an approved biosecurity plan for your property or generate an Animal Health Declaration to accompany stock being transported.

1B is available to South Australian livestock producers with a current Property Identification Code (PIC). There are no costs to register or access online tools.

Livestock producers can register for free at www.onebiosecurity.pir.sa.gov.au. At first use, you will be taken to the program portal which takes you through a Biosecurity Practices Questionnaire and an Endemic Disease Risk Rating module to allow you to receive a biosecurity rating.

You can also choose to complete a disease risk rating, which covers specific endemic diseases that occur in SA, such as Johne's Disease for cattle and sheep, pestivirus for cattle, sheep lice and ovine footrot.

Once your biosecurity profile is set up on the portal, you have the choice to share it publically or keep it private.

To ensure credibility, all information you provide will be verified by PIRSA Animal Health Officers. This is done through online checks of your claims as well as random and targeted on-farm assessments.

PASTORAL ACT REVIEW

Pastoral land in South Australia covers 410,000 square kilometres of the state, comprising 324 leases. The management, condition and use of pastoral lands is provided for in the *Pastoral Land Management and Conservation Act 1989*. A review of the Act provides an opportunity to consider how the value of this significant portion of South Australia can be best realised.

Currently the legislation allows for very specific uses and to futureproof the landscape and those that depend on it, consideration is being given as to how flexibility for a range of uses can be supported. Reviewing the Act will help ensure the approach to pastoral land management meets industry and government priorities and facilitates industry growth and productivity, while ensuring land condition is maintained.

The initial consultation phase closed on 30 September 2019 with all feedback now being considered to modernise the Act. A draft Bill will be circulated along with a summary of what was heard throughout the consultation process, with an opportunity to review the draft Bill and provide further feedback.

Once the final feedback is gathered, a final Bill will be prepared for introduction into Parliament. For more information email PIRSA. PastoralActReview@sa.gov.au

Coongie Wetland Wonders volunteers set a trap line at a fauna survey site

Volunteers clock up 17,000 hours

Volunteers play an important role in helping to manage the environment in the SA Arid Lands NRM region spending thousands of hours working alongside staff in the past 12 months.

Projects volunteers have been involved in include helping to trap threatened species for monitoring, setting up monitoring programs, working on weed and cactus control, building restoration and collecting rubbish.

Across all projects, 250 people provided almost 17,000 hours of volunteer help on projects that were on public and private land.

This includes:

- Mitsubishi 4WD Club, Adelaide Bushwalkers and Toyota Landcruiser Club volunteers cleaned up cactus in the North Flinders district. On five different projects at Oratunga, Angorichina, Mooloolo, Gum Creek and Ikara-Flinders Ranges NP, 3,560 hours were donated by 67 volunteers.
- Thirty seven *Bounceback and Beyond* volunteers provided 1,139 hours of support in 14 different trips that included survey monitoring and mapping, malleefowl monitoring in the Gawler Ranges, herbivore impact assessments, camera deployment and collection and trapping small vertebrates which helps us to protect threatened species.
- Baseline monitoring and a biological survey in the State's far north east recorded 2,395 hours from 18 volunteers as part of the Coongie Wetland Wonders project.
- Friends of Vulkathanaha Gammon Ranges National Park worked on the restoration of the Oocaboolina Outstation for 1,435 hours, while 30 Friends of Ikara Flinders Ranges National Park spent 3,982 hours on general park maintenance.
- Twenty eight members of the Great Tracks Clean Up Crew spent 2,699 hours cleaning the roadside rubbish from Quorn to Innamincka, along the Strzelecki Track.

RARE REWARDS FOR COONGIE VOLUNTEERS

Digging holes, setting traps, impact assessments, survey work and getting a close up look at endangered plants and animals are all in a day's work for volunteers working on the Coongie Wetland Wonders project.

Volunteers travel with SA Arid Lands staff for each trip to the state's far north east for biological surveys and monitoring of threatened plant and animals, as well as pest management activities.

SAAL Community Ecologist Catherine Lynch coordinates the volunteers who come with different levels of experience. Many are university graduates or retirees with an interest in the projects.

Far more than an extra pair of hands, volunteers share their own knowledge and experience and enjoy the comradery that comes from working in a small group for a week or two at a time.

In return, they are able to see native plants and animals – some found only in the area they are working in.

"They get exposed to areas of our region they wouldn't see otherwise," Ms Lynch said.

"It's fantastic being out in the landscape, seeing country and doing things most people wouldn't even know about".

Coongie Wetlands Wonder volunteer

Double action tank float

From top: Example of tank level switches floating and conductive switch types

Control box showing low voltage connection on right (red and black wires)

Pressure sensor screwed into tank outlet fitting

Flow Control in Stock Watering Systems

With solar pumping systems having largely replaced traditional windmills, many pastoralists have found it difficult to reliably control flow from their watering points.

Controlling pumped flow has proven to be problematic and as a result, many users of solar pumping systems avoid the use of a flow cut-off control to eliminate the risk of failure.

Mark Fennell, of Lambina Station who also contracts in the supply and installation of solar pumping equipment, has experimented with controlled watering systems in an effort to find a robust system that provides cost effective and reliably controlled stock watering points.

"Most well designed systems have a pump and solar panel combination that pumps more water than is required to allow for extra consumption by overabundant species or extended cloudy periods when water output will be reduced," he said.

"A typical pump output of 2,500 litres per hour, running for eight hours, is about right for about 400 head of cattle. If cattle numbers are halved, this can lead to wastage of over 10,000 litres per day.

"Controlled pumping systems saves water, reduces wear on pumping equipment and can reduce feral animals and weeds."

To find a solution to the reliability issue, Mark experimented with two methods for flow cut-off, including tank level switches (conductive or floating switch type) and tank/system pressure switches.

"Tank level switches have two types of installations – low voltage, which requires additional control box and high voltage, which requires a relay to switch voltage input off or on," he said.

"Tank level switches are easy to install and adjust for high and low level stop and start, but the downside is the installation must be relatively close to the pump or bore head. Some need an additional control box, which is an extra expense."

Mark said he found float switches less reliable than conductive switches for his installations.

"I found control using pressure switches reasonably reliable in the long term, however they can be susceptible to mineral build-up in some water types," he said.

"Pressure switches have the advantage of being installed at any location after the pump. When the water in the system reaches the pressure set by the user, the switch either opens or closes a low voltage circuit and sends a signal to turn the pump off. This system allows for multiple tanks in multiple locations to be controlled with one switch.

"This works particularly well with some lower-priced pumps with this feature available in their control box."

With this type of control Mark found it was best to add a double-action tank float to prevent excessive surging of pressure, as well as a low water sensor for pump protection. Both can be wired into the same circuit.

At Lambina, Mark has experimented with various brands and systems and through trial and error has developed reliable and cost effective systems that offer flow control, and is happy to share his experiences.

If you have found something that works for you, we're keen to hear about how technology has improved your water management. If you have a method to share, please contact Senior Water Resource Officer Aaron Smith at aaron.smith3@sa.gov.au

DO YOU NEED A PERMIT?

If you have plans to build a new dam, or deepen or enlarge an existing dam you may need a Water Affecting Activities (WAA) Permit.

A water affecting activity is one that diverts water or alters flows from a natural watercourse. It can include the construction or enlargement of a dam greater than 10ML, building or placing of structures in or near a watercourse; excavating or removing rock, sand or soil; and draining or discharging water into a watercourse or lake.

Dam de-silting does not require a permit provided the modified dam is no greater than 10ML.

If you have any questions on Water Affecting Activities please contact Aaron Smith on 8648 5300 or email aaron.smith3@sa.gov.au

Further information on WAA can be obtained from the SAAL website www.naturalresources.sa.gov.au/aridlands/water/water-affecting-activities

Yandruwandha Yawarrawarrka Traditional Owners spent time alongside SA Arid Lands ecologists on a recent biological survey trip on the Innamincka Regional Reserve.

Made possible through the *Coongie Wetlands Wonders* project, Joshua Haynes and Annie Haynes (left) took part in pitfall trap surveys, looking for vertebrate and invertebrate animals including the fat-tailed Dunnart, Bynoes Gecko and Eyrean Earless Dragon.

Part of the work involved setting pitfall traps as well as checking them morning and evening, and recording the species found. Bird and flora surveys also occurred as part of the biological survey.

Joshua and Annie are pictured with Community Landscape Officers Glen Murray and Lucy Goldspink.

BURROWING FROG FIND

Water holding frogs are not often seen in the SA Arid Lands region, but this one was found on Wooltana Station in the Gammon Ranges.

The water holding frog (*Cyclorana platycephala*), was found underground in the soil of a dam, encased in a mucous cocoon to survive the ongoing dry conditions.

Water holding frogs can store up to 60 per cent of their body weight in water in their bladder or pockets under the skin. They can also reduce their metabolic rate and aestivate in an underground chamber for several years.

SA Arid Lands ecologists were excited by the news of this frog find given it is the most southerly record for this frog species in the North Flinders District.

Secret Rocks shares its success

Secret Rocks is thriving due to an investment in fencing and pest control, coupled with drive and determination from the property's owners.

Fifteen kilometres of fencing has secured about 900 hectares of mallee reserve on the Gawler Ranges conservation property in which threatened plants and animals are making a comeback.

Inside the exclosure the country is thickening, despite the drought. It is home to chalky wattle plants and others considered threatened on the Eyre Peninsula. *Acacia cretaceae* (Chalky Wattle), *Pimelea* sp. (Rice flower), sandalwood, *Goodenia*, *Hakea francisiana* (Red Hot Poker) and *Halgania cyanea* plants can be found here, many of which have been planted by Kimba Area School students, using seed provided by the State Herbarium.

John Read talks freely about the success he and his partner Katherine Moseby are having on the property.

"At the right time of year you get the bright red flowers of the Hakea and there are a lot of them germinating inside the fence," he said.

"After that you get a Halgania with the blue flower. It looks really good."

At the property you will also find the threatened sandhill dunnart, and malleefowl mounds that John is hopeful will become more productive in the years to come.

More importantly, what you won't find inside the exclosure are animal scats

The outlook from Secret Rocks

John Read is happy to share the news of his conservation works, as he did as part of a well-attended Gawler Ranges NRM Group Stickybeak Day at his property

belonging to goats, kangaroos, cats and foxes, as these pests have been controlled inside the fence.

John is adamant that control of these pests is pivotal to the success of the couple's plan to raise endangered animals at the site.

"The country here is mallee scrub so it's very hard to remove the kangaroos," he said.

"If we can control them (kangaroos) and get the country back to what we know it was like, we should be able to get some animals returning."

One of those animals is the numbat, for which John is hopeful of providing a protected site in which to raise them. To that end, John is working with the Numbat Recovery Team in an effort to grow its numbers – but controlling cats and foxes is key to increasing the chances of success.

The property's recovery is not an overnight success story, but it is one of partnerships.

John worked with the EMU project 10 years ago, building banks to slow the flow of water. Greening Australia came on board soon after with a direct seeding program which was followed, fortunately, by good rains.

"It all grew fabulously, but then the roos came in and ate everything except the weeds," he said.

"Long-term Gawler Ranges resident Bruce Mills remembers that about 60 years ago he spent a whole weekend trying to catch a roo to eat. Numbers are higher now – his couple of roos have been replaced by a couple of thousand."

The ultimate aim at Secret Rocks is to recreate the natural ecosystem that should be present there, but it has not been a simple process.

"We had some spinifex clumps that were 40 years old, and some that hadn't burned for 60 years," he said

"We decided to burn them out to promote seeding, but it made things worse because it brought the roos in.

"With the roo numbers under control, we might burn again and try to encourage the return of the bandicoot, numbat and birds."

The exclosure has also been a clear indicator of grazing impacts. Outside the fence no new chalky wattle plants have been able to survive, despite the fact there are no sheep on the property and kangaroo numbers are largely under control.

Another of John's concerns is the malleefowl. Once considered to be common in the area, he believes numbers are considerably down.

"We do malleefowl mound surveys each November, but for the past couple of years there have been maybe two active mounds," he said.

As a result, one exclosure was built around the active mounds found in last year's survey and John is hopeful of what will be found when this year's survey takes place.

In the meantime, cameras installed on the property are giving the couple a good understanding of what is going on.

"The cameras have captured a malleefowl chick and some new chalky wattle plants inside the fence," he said

"The country is thickening up, and we're seeing a difference in the grasses and spinifex, which should give the malleefowl the best chance.

"In a year's time, and with more rain, I am looking forward to seeing how things are going. Who knows, we might even be able to get the yellow-tailed black cockatoo back here."

Desert Ladies Day Success

Planning for your financial future, taking care of your well-being and networking were key topics at the inaugural Desert Ladies Day, presented by the SA Arid Lands NRM Board.

Held at the Port Augusta Yacht Club on 26 September, 2019, 30 women from across the region attended the event that was designed by them based on areas of interest they had raised with Board staff at events such as the Marla-Oodnadatta Field Day.

The event included sessions on: Succession planning and planning for your financial future – by Tony Catt from Catapult Wealth; Women in Business Regional Network – Carolyn Jeffrey; Drought Resilience and Self Care – Jeanette Long.

Held during School of the Air mini school week, the day was rated an overwhelming success by those that attended.

Comments included:

"Planning for your future – because it's something positive we can do (as opposed to it not raining)."

"Great day, great speakers, great venue."

'Fantastic and informative day … it was good to have the opportunity to hear from someone that had a really good grip on family succession planning that may be able to help our multi-generation family proceed further. Today gave me that … thank you."

"Meeting and talking with other women in the same situations."

"Self-care – an important reminder to look after you."

"Tools … to help me support myself, my family and my community."

Feedback received on the day will form the basis for future events and training across the region.

Alex Morgan and Sonya Irwin

Susan Pearl, Gini Lee and Joy Newton

Francesca Fennel, Lynly Kerin, Anna Nunn, Kate Greenfield, Joanna Gibson, Katrina Morris and Jill Greenfield

ACROSS THE OUTBACK

Across the Outback is prepared and edited by the Communications team, Natural Resources SA Arid Lands, a division of the Department for Environment and Water. It is funded by the SA Arid Lands NRM Board. This edition also incorporates reporting on the Board's progress which previously appeared in *On Track*. Comments and suggestions are always welcome.

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