



*celebrating 20 years*

# BOUNCEBACK



R Sleep

*building resilience across the ranges*







# BOU

The South Australian Department of Environment, Water and Natural Resources acknowledges the Adnyamathanha, Bangarla, Ngadjuri, Nukunu and Kokatha peoples as the traditional custodians of the lands, waters, plants and animals, in the areas where **BOUNCEBACK** operates.

We recognise and respect that traditional lands or 'country' are central to the spiritual lives and living culture of these peoples.

We aspire to a positive future based on a greater understanding between Aboriginal and non-Aboriginal Australians and endeavour to build strong relationships with Aboriginal peoples based on mutual courtesy, respect and equity.

We will continue to work cooperatively with Aboriginal peoples to conserve country, plants, animals and culture, and strive to achieve reconciliation in our daily work.

Several of the reserves within the *Bounceback* footprint are co-managed by the SA Government and Traditional Owners. *Bounceback* will work closely with local Aboriginal communities to ensure that traditional knowledge and aspirations are included in its future programs.



# NCEBACK

In 2012, **BOUNCEBACK** celebrates its twentieth year.

**BOUNCEBACK** is a landscape scale conservation program, delivering on *NatureLinks*, that aims to protect and restore the semi-arid environments of the Flinders, Olary and Gawler Ranges in South Australia.

**BOUNCEBACK** operates on National Park reserves, Aboriginal owned and managed lands, private sanctuaries, and pastoral lands.

Major achievements

- Recovering Yellow-footed Rock-wallaby populations
- Reduced goat, fox and rabbit numbers
- Regenerating native vegetation
- Linking private and public land managers

The landscapes of the Flinders, Gawler and Olary Ranges are spectacular, with their dramatic scenery, accessible wildlife and diverse vegetation. However, most visitors would not be aware that they are looking at highly altered landscapes.

When species vanish they do so silently, slipping away unnoticed. Absences have no shape, no colour. The conditions and processes that trigger what may be permanent losses of species are also largely invisible. Feral cats do most of their damage after dark. Broadscale environmental weeds bury their impacts in swathes of bright colour that delights the eye. Large mobs of grazing kangaroos excite us, reminding us of who we are. We assume that native animals – reptiles, birds and mammals – have more room than they could ever need in landscapes as large and generous as these.

But the semi-arid ranges of South Australia are fragile places. Since European occupation in the mid 1800s, their resilience has been tested. They have lost native species and gained exotics. Their capacity for recovery after drought has been diminished. These are places that heal slowly, that need time to recover.

In the early 1990s, a small group of rangers and wildlife managers recognized the need for decisive intervention to protect the semi-arid ranges of South Australia from further species losses and ongoing habitat destruction. They launched *Operation Bounceback*.

Under *Bounceback*, SA Government staff, volunteers, landholders and local communities work together to reverse some of the impacts of the last 150 years. As *Bounceback* turns 20, there are spectacular signs of recovery.



# BOUNCEBACK

## Building Resilience

The landscapes of South Australia's semi-arid ranges have evolved over tens of thousands of years. Here, change in condition is a natural part of how things work. This is boom and bust country where native plants and animals, and the ecosystems of which they are a part, are adapted to survive recurring, climate-driven disturbances. Populations decline during periods of adversity, but rebound when conditions improve. We call this capacity for recovery, resilience.

Unnatural disturbances can alter the health and resilience of natural systems, diminishing the capacity of native species to recover, even when conditions are favourable. Over time, as habitats fragment and decline, some species become threatened or extinct, whilst others benefit from changes to the landscape, dramatically increasing their populations to unsustainable levels. These impacts present special challenges for conservation managers.

When Europeans took possession of South Australia's semi-arid range country in the 1850s, they changed the landscape dramatically. The introduction of exotic plant and animal species, and the grazing of livestock brought new levels of disturbance to the ranges. Not only were native species impacted, time-tested natural systems were also seriously compromised.

The decline of the Yellow-footed Rock-wallaby across its range in South Australia prompted the effort to secure rock-wallaby populations in Flinders Ranges National Park (NP) begun in the early 1990s. Under *Bounceback*, integrated pest management would be supported by science, so that threats might be better understood and managed. Over time, what began as a program to secure a threatened species, evolved into a landscape-scale conservation program. With its expanded vision, investment and resources, *Bounceback* extended its reach across park boundaries to other land tenures in the Flinders, Gawler and Olary Ranges, in partnership with landholders, the SA Arid Lands and Northern & Yorke NRM Boards, other conservation organizations and volunteer groups.



Gawler Ranges in dry years



Gawler Ranges in good years

### RESILIENCE

*The power or ability to rebound or spring back; ability to recover readily from a setback or adversity*

**Shorter Oxford Dictionary**

### LANDSCAPE SCALE CONSERVATION

Landscape scale management recognizes that conservation issues do not stop at property boundaries and should involve the wider community across different land tenures. This approach offers native plants and animals the best possible chance of adapting to the challenges of climate change, which is predicted to bring increased temperatures and decreased rainfall to the region. Major government initiatives, like *NatureLinks* and the *National Wildlife Corridors Plan*, prioritise conservation projects that provide connectivity and improved native vegetation condition across the landscape and have a partnership approach to delivery.





Flinders Ranges

## The **BOUNCEBACK** Footprint

The *Bounceback* project area includes the Flinders Ranges (southern, central and northern), Olary Ranges and Gawler Ranges. Most of the properties within the *Bounceback* footprint, including all protected areas, have a livestock grazing history. *Bounceback* operates across the landscape, on and off government reserves.

### FLINDERS RANGES

The Flinders Ranges straddle two major bioclimatic regions. Climatic variation, along with complex landforms that include mountains, plateaus, gorges, creeklines, valleys, floodouts, plains and dunefields, have created diverse habitats with great species richness. Threatened species, endemics and relicts, are found in an archipelago of habitats the length of the ranges, with reserves providing core areas for conservation management.

### OLARY RANGES

The Olary Ranges are a landscape of hogback ridges, rounded granite hills, creeklines and broad flanking plains, with low, unreliable rainfall and high annual evaporation. Bimbowrie Conservation Park (CP) and Boolcoomatta Reserve, former pastoral leases, are now managed for conservation. The adjoining Plumbago Station has been an important part of Yellow-footed Rock-wallaby recovery for 30 years. Here, a diverse range of plants and animals, some with national and state conservation ratings, are protected in core areas for regional biodiversity conservation.

### GAWLER RANGES

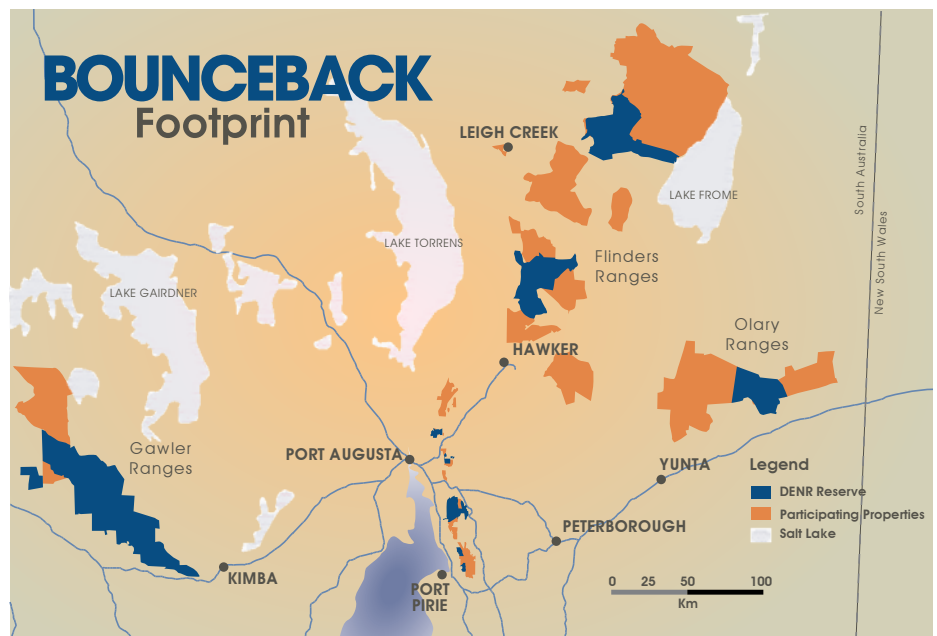
The distinctive granite and volcanic landforms of the Gawler Ranges are part of an ancient, stable landmass. Vast hills and gully complexes, rocky gorges, spectacular 'organ pipe' formations, and dunefields characterize the area. The dramatic topography and varied land systems of Gawler Ranges NP, Pinkawillinie CP and adjacent properties support diverse habitats for a range of species of conservation significance, including the Yellow-footed Rock-wallaby.



Olary Ranges



Gawler Ranges





Yellow-footed Rock-wallaby

## Restore, Control, Link

Some landscapes within the *Bounceback* footprint are more resilient than others. Their condition reflects historic and current grazing pressure. The capacity of each landscape to recover from the impacts of drought when bust swings to boom has been diminished to some extent.

Across the *NatureLinks* corridors of Flinders-Olary and East meets West (which takes in the Gawler Ranges), the quality of native habitats has declined as a result of grazing impacts from exotic and native herbivores. Competition from introduced plants, some of which have become broad-scale environmental weeds, has further diminished habitat quality. Local extinctions discriminate towards native mammals in the critical weight range of 35gm to 5.5kg, such as bettongs, bilbies and bandicoots. Introduced predators continue to threaten native species like the Yellow-footed Rock-wallaby, ground-nesting birds and a range of reptiles. By linking efforts to restore natural habitats and control threats to biodiversity, *Bounceback* aims to conserve and improve biodiversity across the region.



Regrowth of Striated Minibush following goat control

### RESTORING HABITATS

The repair and restoration of native habitats is complex and challenging. There is no quick fix, particularly for ecosystems shaped by boom and bust cycles, where disturbance and decline are a natural part of how things work. Over time, *Bounceback* aims to improve the condition of native vegetation communities, so that they become more resilient and can support native animal populations through boom and bust cycles. Recovery can be measured using indicator species – plants and animals whose populations have been dramatically impacted by long-term disturbance.

### CONTROLLING THREATS

Introduced plants and animals not only threaten native species, but their impacts may result in irreversible or difficult-to-reverse changes to ecosystem function. When native vegetation is removed from the landscape, wind and water strip away fragile topsoil and open up the country to erosion. As well as losing the structural components of animal habitats, vital nutrients are lost from the landscape. By controlling threats from pest plants and introduced predators, and by managing total grazing pressure, *Bounceback* aims to enhance the resilience of plant communities and the creatures they support.

### LINKING EFFORTS

Through its *NatureLinks* initiative, the SA Government recognizes that conservation beyond park boundaries will be required if ecosystems, habitats and native species, are to survive the challenges of climate change. When habitats are fragmented, gene flow is restricted and the resilience of species is diminished over time. Habitats that are connected across the broader landscape give species the best possible chance of adapting should temperatures rise, rainfall decrease, and damaging, high-energy events become more frequent. Fostering and maintaining partnerships is essential for building resilience across the *Bounceback* footprint.

# BOUNCEB



# RESTORING HABITATS

Native habitats supply species with all the resources required for survival – food, water and shelter – and facilitate gene flow. Although they are disturbance-adapted, the native habitats of South Australia’s semi-arid ranges are highly susceptible to the cumulative impacts triggered by European occupation.

Most of the properties within the *Bounceback* footprint are former or existing pastoral leases. Many leases were overstocked during the early occupation years. Pastoralists and government advisers of the time had little understanding of boom-and-bust-driven systems or the long term carrying capacity of the land. Later, grazing pressure intensified as rabbits and feral goats established wild populations. Large macropods benefitted from bores and dams, and changes to the composition of native pastures, increasing their numbers dramatically. With so much pressure on native vegetation, some habitats were completely destroyed causing the extinction of many native species. The mammals of the Flinders Ranges were hit particularly hard: 20 of the original 54 species are now extinct in the ranges.

Under *Bounceback* native vegetation and land condition have seen a marked improvement in core areas: Flinders Ranges NP, Gawler Ranges NP and Bimbowrie CP. Palatable chenopods such as Bitter Saltbush and Low Bluebush, and other long-lived perennial species like Bullock Bush, Mulga and Black Oak are recovering. Threatened species such as Yellow-footed Rock-wallaby, Short-tailed Grasswren and Malleefowl are rebuilding populations in response to fox control and improved habitat.



Triodia covered hills provide Grasswren habitat

## BUSH BIRD BAROMETERS

The ground-dwelling Short-tailed Grasswren is a small, secretive bird found only in South Australia. It lives in *Triodia*-covered hill country in the Flinders and Gawler Ranges. Until a decade ago, little was known about its ecology, distribution or conservation status. Because of its patchy distribution, the Short-tailed Grasswren was chosen as a key species to monitor ecological recovery of *Triodia* habitats in the *Bounceback* project area.



Short-tailed Grasswren

Lynn Peadar

Surveys have revealed that the extent of *Triodia* cover, the presence of shrubs and the amount of bare ground or rocks between *Triodia* hummocks, strongly influence the distribution of the Short-tailed Grasswren.

*Bounceback* has shown that the following management issues are likely to have a direct bearing on securing optimum habitat for the Short-tailed Grasswren:

**Fire management** – Grasswrens will recolonise burnt areas, but regenerating *Triodia* cannot support the birds for at least six years. Mature stands appear to provide optimum habitat.

**Total grazing pressure** – Areas with high litter content will not support grasswrens. Euros graze and trample *Triodia*, creating ground litter. In high numbers near suitable grasswren habitat, Euros may threaten the quality of that habitat.

**Predator control** – Foxes influence the distribution and abundance of grasswrens. Populations are found in greatest abundance where fox numbers have been reduced through *Bounceback* baiting programs.

# ACK

# RESTORING HABITATS Monitoring

Monitoring recovery and integrating what is learned through adaptive management, is an essential component of the *Bounceback* program. The untangling of genuine recovery from huge fluctuations in condition, through boom and bust cycles, is an ongoing challenge. Objective measures must be used to identify long-term changes or trends in land condition. *Bounceback* has adapted a pastoral lease assessment tool, the Land Condition Index, to document the long-term effects of total grazing pressure management in reserves in the Flinders, Gawler and Olary Ranges.

Land Condition Assessments are part of a formal monitoring program for South Australia's pastoral leases. Every few years about 100 randomized sites are sampled across all land systems on each property, using road and track networks, to provide a whole-of-landscape measure of condition. Photopoint data is also used to monitor long-term changes in vegetation and land condition. Thus, long-term trends can be differentiated from responses to naturally occurring boom and bust events.

Scores (1-3) are used to determine an overall Land Condition Index (LCI) that can be ranked relative to surrounding landholdings. Highly impacted sites are rated at 1. Intact sites or those with significant regeneration of indicator species, have a value of 3.

Improved LCI scores in Flinders Ranges and Vulkathunha-Gammon Ranges NPs, and other reserves reflect widespread recovery of palatable perennial species, including regeneration of the long-lived

species: Bullock Bush, Plum Bush, Mulga, Long-leaved Emu Bush and Dead Finish; recruitment of shrub species including Elegant Wattle, Bitter Saltbush and Silver Tails; and large native grass germination events following good rains. Reduction in total grazing pressure has encouraged widespread regeneration of shrub and tree species. Recovery of these dry country vegetation communities will take many decades and is dependent on good rainfall events and continued grazing management.



## FLINDERS RANGES NP

Year	1997	1999	2002	2008	
<b>LCI</b>	1.59	1.5	1.68	1.93	
<b>Condition Score (%)</b>	1 – Poor	49.1	58.65	44.5	28.1
	2 – Moderate	42.6	32.7	42.7	50.4
	3 – Good	8.3	8.65	13	21.5

## VULKATHUNHA-GAMMON RANGES NP

Year	1999	2002	2010	
<b>LCI</b>	2.08	1.72	2.41	
<b>Condition Score (%)</b>	1 – Poor	26.92	47.20	10.89
	2 – Moderate	37.68	34.50	38.62
	3 – Good	35.40	18.60	50.49



## PHOTOPOINTS

Photopoint monitoring is a simple tool that is used to document changes in native vegetation over time. Photographs are taken from a fixed point at regular time intervals, building up a valuable record that can reveal long-term trends in condition. Information about the changes in presence and abundance of species is also collected. Results are analysed and evaluated to test whether management strategies are delivering desirable outcomes.





## CONTROLLING THREATS

Threats to native habitats come from several directions. Predation by introduced animals contributes to local extinctions and continues to influence the abundance of native species in South Australia's semi-arid ranges. Introduced herbivores, like goats and rabbits, have established wild populations in the ranges and compete with native animals for resources. Unnaturally high numbers of native grazers that have benefitted from changes to the landscape exert considerable grazing pressure and inhibit recovery in areas where introduced grazers have been suppressed. Weeds compete with native vegetation for space in the landscape, often forming broad swathes that dominate very large areas. *Bounceback* and its partners have made considerable progress in controlling these threats, moving from resource-intensive 'knock-down' treatments to maintenance programs. SA Arid Lands and Northern & Yorke NRM Board pest control programs on pastoral properties provide important threat control buffers adjoining core *Bounceback* areas.

### FOXES

Foxes are highly opportunistic animals whose adopted home has provided them with a niche as a top order predator, where dingoes have been excluded or controlled. Foxes have contributed to local extinctions of native species and continue to be a major threat to the survival of native fauna across Australia, particularly small to medium-sized terrestrial mammals and ground-nesting birds.

Ground baiting, using semi-dried 1080 meat baits, was one of the first activities to be implemented under *Bounceback* in 1993. Initially targeting accessible Yellow-footed Rock-wallaby habitat, the baiting footprint was gradually expanded across reserves and into buffer zones on adjacent properties. Currently, fox baiting covers 5500 km<sup>2</sup> of the *Bounceback* footprint.

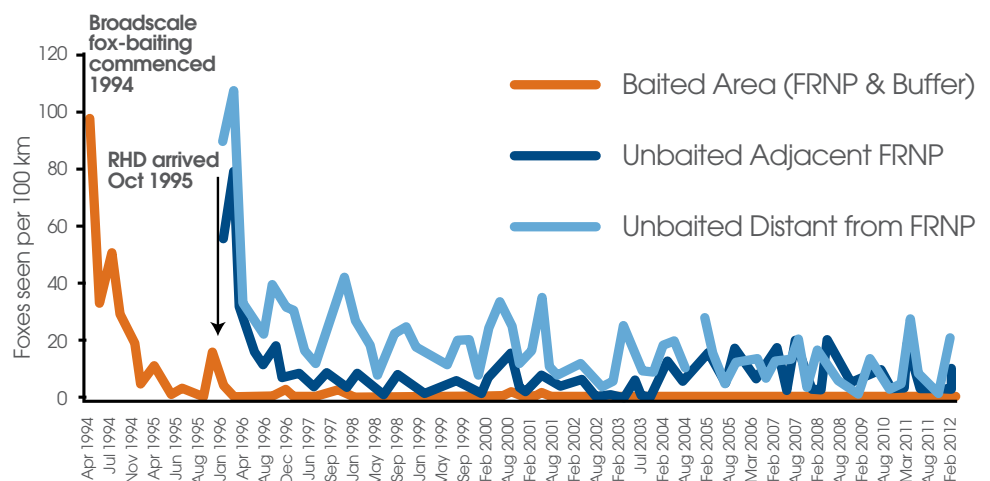
Complementary aerial baiting was introduced in 2001 to provide more effective bait coverage in rugged and inaccessible terrain. To maximize its impact, aerial baiting is timed to coincide with fox breeding in winter and dispersal of young in late summer. Tight regulations control how and where 1080 baits can be used,

with bait-free buffer zones around residences, recreation areas and waterways, and along roads and property boundaries.

Fox numbers have been dramatically suppressed within the baited footprint, where sightings remain very low. On average, less than one fox is sighted per 100 km of spotlight transect; 10-20 foxes are observed over the same distance in unbaited areas.

A coordinated landscape scale approach to baiting has reduced the impact of fox predation on native fauna and improved biodiversity across the semi-arid ranges. Yellow-footed Rock-wallaby populations are trending upwards. Sightings of Carpet Python, Echidna and Sand Goanna have increased. The successful suppression of foxes would not have been possible without the support of landholders, volunteers and the wider community.

### EFFECT OF 1080 BAITING AND RABBIT HAEMORRHAGIC DISEASE ON FOXES IN FLINDERS RANGES NATIONAL PARK





# CONTROLLING THREATS

## Grazing pressure

In South Australia's semi-arid ranges, vegetation is the glue that holds the landscape together. Plant litter returns nutrients to hungry soils after processing by termites and microorganisms. Roots hold shallow soils in place, hidden foils for the wind and water erosion that robs habitats of resources. Vegetation impedes water flow across the landscape in high-energy rainfall events, retaining resources that contribute to habitat quality. Plants provide food, shelter and nesting sites for native fauna. When native vegetation is degraded or destroyed, native animals inevitably struggle to survive as their habitats collapse.

Historic and persistent grazing pressure by native and non-native species, has prevented native plant communities from regenerating across much of South Australia's semi-arid ranges. When livestock was removed from former pastoral leases, now managed for conservation, new managers expected the country to rebound. But rabbits, goats and kangaroos more than compensated for the removed stock, and native vegetation continued to decline in many areas. The reduction of total grazing pressure is a principal aim of *Bounceback*, backed by the grazing management program described in the next few pages.

### GOATS

Able to thrive in semi-arid environments, feral goats utilize a broad range of habitats across the *Bounceback* project area. Numbers of these highly fertile species may explode following big rainfall events, when plant recruitment is also at its most dynamic. Goats are generalist feeders, both browsing and grazing when conditions are favourable. During droughts, goats can have major impacts on perennial vegetation, damaging shrubs and trees as they clamber to reach palatable material. Feral goats occupy the same habitat as Yellow-footed Rock-wallabies, and compete for food, water and shelter.



Regrowth of eremophila following goat control

### RABBITS

The European rabbit is a major environmental pest across Australia. Rabbits suppress plant recruitment, destroy perennial vegetation, and open soils up to erosion by grazing off all vegetation around warrens. A large rabbit population is also likely to support introduced predators, including foxes and cats, which also prey opportunistically on native fauna. Within the *Bounceback* footprint, the highest historic rabbit infestations were found in the soft plains and low hilly country of Flinders Ranges National Park.

### KANGAROOS

Kangaroo numbers are significantly higher today than before European occupation of the range country. Changes to the landscape have served the large macropods well. The erection of the Dog Fence and the suppression of dingoes removed the top predator from semi-arid ecosystems. Bores and stock troughs provided easier access to water and Aboriginal hunting was greatly reduced after the Europeans arrived. Some species are now overabundant and suppress native vegetation recovery in much the same way as livestock and feral goats.

### TOTAL GRAZING PRESSURE

The combined pressure exerted on native vegetation by all grazing and browsing animals present in an ecosystem, including livestock, introduced herbivores like rabbits and feral goats, and native mammals, particularly large kangaroo species.



Goat browseline on bullock bushes

BOUNCEBACK celebrating 20 years

# BOUNCEBACK





▶ Sporting Shooters play a vital role in ground control

## CONTROLLING THREATS

### Feral Goats

The feral goat is a major environmental pest with its highest densities in Australia’s arid and semi-arid rangelands. In South Australia’s pastoral zone, feral goats are closely associated with the hilly country of the Flinders Ranges, Gawler Ranges and Olary Ranges. It is not surprising then that feral goat control has been a major focus of the *Bounceback* program since it began.

Adult feral goats have no predators in South Australia’s semi-arid ranges. They become sexually mature at an early age and have high reproductive capacity. This means they can increase their numbers quite dramatically in a relatively short time, often following good rains. Feral goats have a herding instinct and move across the landscape in large mobs, feeding intensively over relatively small areas. Because they need to drink every day in hot weather, they congregate around small waterholes and springs, aggressively competing with native animals for access to water. During drought, feral goats foul waterholes, which are critical resources for stressed wildlife. Feral goats browse established shrubs and trees, prevent regeneration of seedlings, and overgraze grasses and forbs when other food is in short supply. They seek out palatable plants like Long-leaved Eremophila, Mulga, Bullock Bush and particular Bluebush and Saltbush species.

The *Bounceback* goat control program aims to achieve long-term suppression of goat numbers to reduce browse pressure on native vegetation across the ranges. It began in 1992 and was one of the first programs to operate at a landscape scale across several properties. Thousands of goats were mustered and removed from reserves in the early years by the Sporting Shooters Association of Australia (Hunting & Conservation Branch),

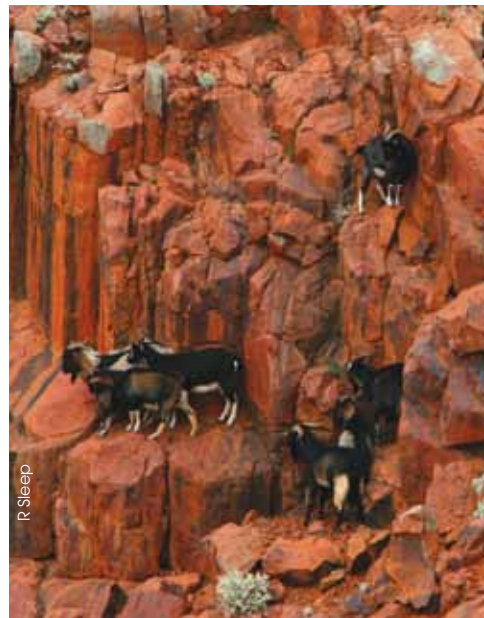
rangers and contractors. Aerial control began in the mid 1990s and expanded to include the Gawler and Olary Ranges in 2002. The aerial program can go into inaccessible terrain, where ‘hotspots’ can be targeted, and covers large areas in a short time with minimal impacts on tourist and pastoral activities. The aerial program complements ground control by Sporting Shooters and ranger staff. NRM Boards encourage landholders to also undertake feral goat management.

After 20 years of control, results are encouraging, with more than 140,000 goats removed from a 12,000 km<sup>2</sup> treatment

area. Goat densities have steadily reduced in areas where control has been consistent, even during boom years. Research at Bimbowrie CP shows that previously browsed Mulga plants have on average doubled their height between 2006 and 2010; Dead Finish plants have increased by one-third in the sustained absence of goat pressure.

#### CHALLENGES

Feral goat control will only be effective in the long term if managers across all land tenures participate. Where goats continue to breed up on untreated properties, migration pressure will be felt on adjoining properties, including reserves. This ‘hole in the bucket’ devalues the investment made by those who actively collaborate to control feral goats. *Bounceback* and NRM Boards continue to encourage participation from pastoral properties in goat control operations.



R Sleep





## CONTROLLING THREATS

### Rabbits

The impact of the European rabbit is most devastating in semi-arid and arid environments, where perennial vegetation is adapted for limited browsing pressure and is generally slow growing. Some plant species like Mulga take many years to establish and remain vulnerable to rabbits for decades rather than years. In boom and bust systems, vegetation condition may decline over many years, recovering when the big rains return. If rabbits are present, they bring another layer of pressure to an already stressed system. Unpalatable weeds outcompete and eventually replace more palatable native species, further impeding native vegetation recovery.

*Bounceback* has focused its broad-scale rabbit control program in the north-eastern section of the Flinders Ranges NP. With densities of more than 100 warrens per km<sup>2</sup>, this area had the most concentrated rabbit infestation of any property within the *Bounceback* footprint. *Bounceback* also carries out small-scale rabbit control in other areas such as Arkaroola Wilderness Sanctuary and the Gawler Ranges NP.

The dramatic collapse of rabbits following the spread of Rabbit Haemorrhagic Disease (RHD) in 1995, created an opportunity for broad-scale control works whilst rabbit densities were low. Researcher, Greg Mutze, began a large-scale rabbit control trial on Flinders Ranges NP and neighbouring

Gum Creek Station in 1992, to assess the benefits of intensive rabbit control for native vegetation regeneration. Building on this trial, *Bounceback* implemented an intensive rabbit control program in the mid 1990s, targeting an area of low hills and plains east of Oraparinna, which supported very high rabbit densities. By 2002, warrens had been ripped across a 190 km<sup>2</sup> area. Over the next 10 years, extensive follow up focused on searching for and treating new holes, using explosives. A further 140,000 rabbit holes were destroyed.

Quarterly spotlight counts, conducted in treated and untreated sections of Flinders Ranges NP, have been used to measure the effectiveness of rabbit control on the park. Spotlight counts from 1996-2006 revealed that in untreated areas rabbit densities



Contractor Peter Baker carried out extensive work blasting rabbit warrens

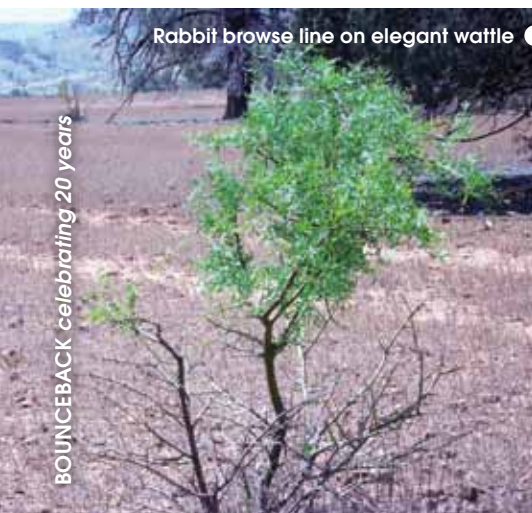
averaged 400/100 km of spotlight transect, 10 times the number in treated areas (around 40/100 km).

Since then, numbers have increased in both treated and untreated areas as the impact of RHD has lessened and, more recently, in dramatic response to good seasons. 2010-11 surveys indicate an average of 2500 rabbits/100 km in untreated areas, compared with around 200/100 km in treated areas. Removal of a key predator as a result of the broadscale fox baiting program has also contributed to the very high rabbit numbers in the park.

Vegetation monitoring shows improved recruitment of perennials with sustained rabbit control. Significant increases in the number of juvenile Elegant Wattle and Bitter Saltbush plants have been observed, followed by recovery of native grasses and small highly palatable chenopods, such as Satiny Bluebush, in the recent good seasons.

SA Arid Lands and Northern & Yorke NRM Boards support complementary programs for rabbit control. The Boards continue to invest significantly in rabbit management programs, particularly rabbit warren ripping, for long-term vegetation recovery across the pastoral areas.

Rabbit browse line on elegant wattle



### CHALLENGES

*Bounceback* aims to maintain low rabbit numbers in treated areas to reduce grazing pressure on native plants. But rabbits are resilient and control is labour intensive and therefore very costly to deliver. Increased plant cover, due to effective control and a run of good years, has made it harder to locate new holes and rabbits also use the increased cover for shelter instead of being completely reliant on warrens. An external review of the program in 2009 concluded that warren blasting, on its own, could not maintain reduced rabbit densities. *Bounceback* is now using 1080 poison oat baiting as a more effective control method in a recovering landscape.



# BOUNCEBACK

## CONTROLLING THREATS Kangaroos

Kangaroo numbers are significantly higher today than they were before Europeans took up pastoral leases across South Australia's semi-arid ranges. The removal of the dingo from large areas of the rangelands has left the kangaroos without a predator. Stock-troughs and dams have enabled them to inhabit areas that were previously unavailable because they were too far from permanent water. On pastoral properties, kangaroos are managed through a commercial harvesting program. When combined with grazing pressure from introduced animals, unnaturally high kangaroo populations pose a special threat to native vegetation, particularly during droughts.

Kangaroo management is an important element of *Bounceback's* total grazing management program. Native plant recruitment and survival cannot significantly improve while kangaroos remain overabundant. Ongoing recovery of native vegetation communities underpins the restoration of native habitats in core *Bounceback* areas across the ranges.

A 1997 Land Condition Assessment for Flinders Ranges NP produced a Land Condition Index of 1.59 (on a scale of 1-3). The park was ranked 23rd out of 27 properties assessed in the area, most of which were pastoral leases where livestock grazing continues. Although goat and rabbits numbers had been reduced, this low LCI score confirmed that grazing pressure was still occurring at unsustainable levels. Additional grazing impacts were attributed to kangaroos.

Kangaroo culling was introduced in Flinders Ranges NP in 1999, targeting Euros, which had reached densities of more than 100/km<sup>2</sup> in some parts of the park. *The Code of Practice for the Humane Shooting of Kangaroos* is strictly observed.

While it has proved difficult to achieve and maintain target kangaroo densities, vegetation recovery has been significantly

assisted by kangaroo control. Further reductions in Euro densities will be required in some plant communities before native grass recruitment will significantly improve.

In the Gawler Ranges, kangaroo management has focused on reducing the impact of the Western Grey Kangaroo, which is overabundant in that area.

### CHALLENGES

Kangaroos need to be managed to levels where they no longer limit the recovery of native plant communities. Whilst their numbers continue to exceed target densities, large kangaroos will seriously compromise *Bounceback's* total grazing pressure management program. This will be a special challenge for Co-management Boards as the SA Government and Aboriginal communities collaborate to deliver park management.

**Kangaroos have been culled on reserves under the State *Kangaroos on Reserves (population control) Policy*, which requires that management be conducted in a transparent, scientifically credible and accountable manner, without compromising the regional status of kangaroo populations.**



Impacts of kangaroo grazing outside exclosures







Pepper trees fruit prolifically

## CONTROLLING THREATS

### Weeds

Weeds are present in most environments across the *Bounceback* footprint but not all have pest plant status or are targeted for control. Environmental weeds such as Onion Weed and Wards Weed cover thousands of hectares and it is not feasible to attempt to control them. Weeds provide some cover in degraded landscapes. They are spread by water, wind, stock, native animals and humans. They change vegetation communities and reduce habitat quality, making it harder for native animals to get the resources they need for survival.

Weed control is labour intensive and expensive, requiring initial knock-down treatments with sustained follow-up over long periods to ensure that new recruits are removed, preventing re-establishment. Weed control programs have to be achievable and sustainable, or the investment will be lost, as short-term benefits rapidly disappear. For these reasons *Bounceback* has focused on a small number of infestations to prevent the further spread of highly invasive weeds like Wheel Cactus, African Boxthorn (both declared Weeds of National Significance in 2012) and Pepper Tree.

#### OLARY RANGES

##### Boxthorns & Pepper Trees

Scattered occurrences of African Boxthorn and Pepper Tree are found along creek lines on several properties in the Olary Ranges. They diminish the integrity of River Red Gum and other native habitat. Once these weeds become established along creek lines they can move large distances, spreading downstream onto other properties, with each flood event.

In the Olary Ranges, several local landholders are controlling Pepper Tree and Boxthorn on their properties. Work commenced on Bimbowrie Conservation Park and adjacent Plumbago Station in 2006, and on Boolcoomatta Reserve, owned by Bush Heritage, in 2007. On Bimbowrie, 300 hectares have been treated.

When work began, it was discovered that treatments that had delivered good results in other places, were not as effective in the Olary Ranges. Trials showed that

mechanical removal, coupled with chemical treatment (Access and diesel) was the best approach, with a 90% success rate. Follow-up will be required for at least 10 years to ensure that new populations do not become established. Emu bush and Saltbush are now growing where African Boxthorn and Pepper Tree have been removed.

#### FLINDERS RANGES

##### Wheel Cactus

Wheel Cactus, found across a large area in the central Flinders Ranges, is a highly invasive species. It occupies a number of ecological niches including dry watercourses, rugged cliff faces, dense native pine woodland, floodouts, and mountain ridges. Plants can occur at very high densities in some areas, dominating the understorey, reducing biodiversity by eliminating habitat for native animals and out-competing native plant species.

Control work began in the Flinders Ranges in the late 1990s with a *Bounceback*-delivered treatment trial on Alpana Station. Since then, rangers, landholders and volunteers have worked to control Wheel Cactus both on and off reserve. Hundreds of hours have been spent working on its control across many properties. The application of herbicide, either as a foliar treatment or leaf pad injection has proved to be the most effective treatment. Vigilant follow-up is required to locate and treat all newly recruited plants.

NRM Boards provide support to landholders and community groups to control infestations of environmental weeds across the region. One example is the investment in the Blinman-Parachilna pest plant control group who are working to remove Wheel Cactus, and other cactus varieties.



Chemical injection of wheel cactus





Steve Coulter  
Flinders Ranges Landholder

*“Our place works really well with the Bounceback program. It has been destocked for around 15 years, so the fox baiting and aerial goat cull are welcome... You need to be prepared for the good years, because the feral animals breed up in the good seasons in the same way the native animals do. Bounceback is about being prepared for the good seasons, getting rid of the feral animals, so that when they come, the native species have room to breed up. I have seen the results – there has been lots of reptile activity in the last few years that you probably would not have seen if the fox baiting was not working so well... Bounceback is great, I take my hat off to those who set up the program all those years ago.”*



## LINKING EFFORTS

As the *NatureLinks* philosophy recognizes, landscape scale conservation is not possible without the support and involvement of the wider community. Partners have been, and will continue to be, critical to the success of *Bounceback*. Reaching across many different land tenures, *Bounceback* has collaborated with volunteers and landholders on pest control, habitat restoration, survey and

monitoring. Other partners have been involved in research, management of threatened and significant species and land condition assessments.

Volunteers have contributed thousands of hours to *Bounceback*. Some groups like the Hunting & Conservation Branch of the Sporting Shooters of Australia (SA) have been involved with *Bounceback* since the very beginning. Their invaluable support has helped control goats, foxes and cats, both on and off reserve.

“The commitment of the Hunting and Conservation Branch of SSAA is outstanding – still our largest Friends of Parks group, 20 years strong and still going.”

**GEOFF AXFORD, SA Government**

### BOUNCEBACK PARTNERS INCLUDE:

- Adnyamathanha community
- Arkaroola Wilderness Sanctuary
- Australian Wildlife Conservancy
- Biosecurity SA & other government researchers
- Bush Heritage Australia
- Contractors delivering pest control and other conservation works
- Park Co-management Boards & Aboriginal Advisory Groups
- Landscape Partnerships
- Landholders
- Nature Foundation SA
- Northern & Yorke NRM Board
- SA Arid Lands NRM Board
- Sporting Shooters Association of Australia (SA) Inc – Hunting & Conservation Branch
- University researchers
- Volunteers: Conservation Volunteers Aust, bushwalking clubs, Friends of Parks, 4WD clubs, individuals
- Yellow-footed Rock-wallaby Preservation Association
- Zoos SA

Kaz Herbst  
Sporting shooter

*“The Hunting & Conservation Branch, Sporting Shooters Association of Australia (SA) (SSAAH&C) has been involved with Bounceback since about February 1992... I believe that the partnership has been so successful because SSAAH&C developed and practiced high standards of training and field operations, to ensure safety, animal welfare and effectiveness. DEWNR staff have supported the partnership with appropriate management and policies, such as operational sequencing of muster, ground shoot, and aerial shoot, to maximize benefits and effectiveness.”*



# BOUNCEBACK



Beautifully marked Yellow-footed Rock-wallabies, sunning themselves on the rocky slopes of gorges in the morning, or coming down to creeks to drink in the evening, are now one of the highlights for visitors to parks and off-park sanctuaries in the ranges. This was not the case 20 years ago when casual sightings were rare.

## Innovation & Adaptive Management

In the 1990s, the concept of landscape scale management for biodiversity conservation was notional and untested. It would become the new paradigm for biodiversity conservation management, shaping policy, the design of programs and funding priorities. *Bounceback* led the way with its 'both sides of the fence' approach to biodiversity conservation management in South Australia, working on and off reserve, to implement programs of regional importance. Today, programs like *NatureLinks* and the *Trans-Australia Eco-Link* build on *Bounceback's* innovative contribution.

*Bounceback* broke new ground by integrating science with on-ground works so that programs could be evaluated in tandem with delivery. *Bounceback* has worked closely with researchers from various institutions to trial innovative approaches to pest control, for example, a recent trial of a new feral cat bait and using unmanned aircraft to map Wheel Cactus in inaccessible areas. The close integration of science and on-ground works underpins *Bounceback's* adaptive management approach.

### ROCK-WALLABIES REBOUND

An iconic species of semi-arid range environments, the Yellow-footed Rock-wallaby is both a target and key indicator species for the *Bounceback* Program. Its South Australian range extends from the Gawler Ranges in the west to the Olary Ranges in the north-east of the State. Government-funded surveys in the 1970s-80s indicated that Yellow-footed Rock-wallabies were in serious decline, with some local populations at risk of extinction. There was an urgent need for coordinated pest control if this species was to survive.

Research findings in Western Australia identified the fox as a major predator of rock-wallabies. Unlike other macropods that are not so tightly bound to territories, rock-wallabies live in colonies with a fixed home range. This, along with their smaller size, makes them very vulnerable to predation. Feral goats also use the same habitat as rock-wallabies, and compete for food, water and shelter.

In areas where *Bounceback* has conducted broadscale fox and goat control operations, recovery has been spectacular, with numbers increasing significantly in wetter seasons and holding even through prolonged years of drought.

Much more is now known about the ecology and genetics of the Yellow-footed Rock-wallaby. Aerial and ground surveys are conducted at specific sites across the ranges to assess their response to management programs.

Yellow-footed Rock-wallaby numbers in Flinders Ranges National Park have increased from fewer than 50 in 1993 to more than 1000 in 2009, with similar dramatic increases seen in other parts of the Flinders and Olary Ranges.

In Gawler Ranges National Park, the Yellow-footed Rock-wallaby population is thriving where *Bounceback's* fox and goat control programs are operating. This contrasts starkly with nearby Hiltaba Station where the rock-wallaby population has declined to just a few individuals. Nature Foundation SA has purchased Hiltaba Station and integrated pest control is planned to begin in 2012.





## Dedicated Delivery

*Bounceback* is the product of a dedicated group of men and women, for whom conservation of South Australia's semi-arid ranges is of huge importance. They have had many different roles in the development and evaluation of *Bounceback*'s programs, and the delivery of on-ground works. This page celebrates the dedicated efforts of the many government staff, contractors and volunteers who have contributed to *Bounceback* over two decades.

For 20 years rangers, other operational staff and contractors have carried out much of *Bounceback*'s on-ground works, sometimes working day and night, in all conditions. Activities include mapping, weed control, fencing, culling, spotlight counts, seed collection, land rehabilitation, warren-blasting, fox-baiting, rock-wallaby trapping, bait manufacture and mustering. Ecologists, from both government and universities have made a huge contribution bringing scientific rigour to the program through monitoring, evaluation, and adaptive management.

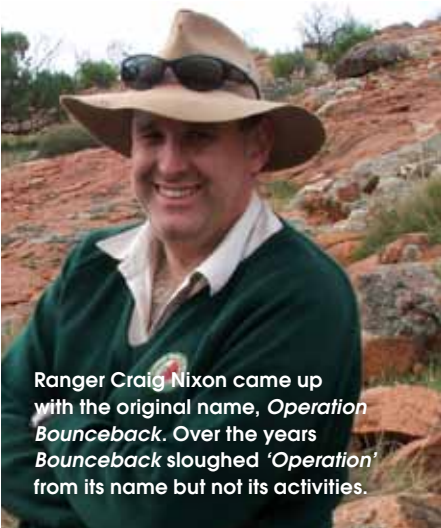
Without the support, strategic planning and funding provided by managers in leadership roles at District and Executive levels, *Bounceback* could never have evolved

into the successful landscape scale program it is today. Grants from State and Federal Governments have enabled the program to expand its scope, footprint and operations. Contributions and collaborations with partner organizations have also been crucial.

*Bounceback* has won a number of Environmental Awards, including the 2001 National Banksia Award (Land, Bush & Waterways Management) and a 2009 award from the Society of Ecological Restoration as one of the 'Top 20' restoration programs in Australia and New Zealand.

"There are all manner of landmarks and milestones associated with this program which are stories in their own right... Without getting too sentimental, I'm sure many of us would agree that we have been privileged to be involved in this program over the last 20 years and to have worked with some incredible people..."

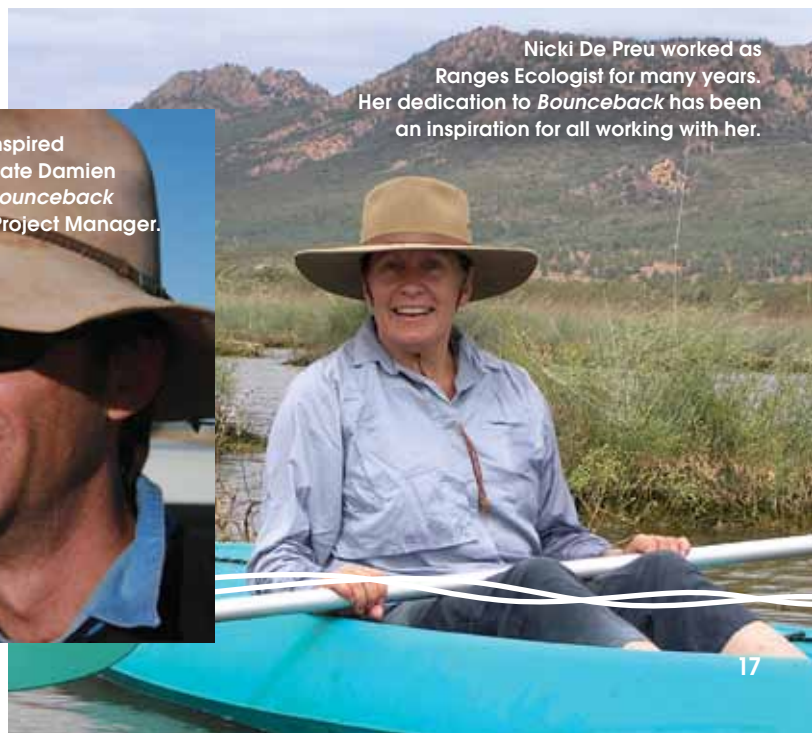
**TREVOR NAISMITH,**  
SA Government



Ranger Craig Nixon came up with the original name, *Operation Bounceback*. Over the years *Bounceback* sloughed '*Operation*' from its name but not its activities.



We remember the inspired leadership that the late Damien Pearce brought to *Bounceback* during his years as Project Manager.



Nicki De Preu worked as Ranges Ecologist for many years. Her dedication to *Bounceback* has been an inspiration for all working with her.



# BOUNCEBACK



## The Next Twenty

When *Bounceback* was launched, everyone involved knew this program would offer no quick fix for problems that were one and a half centuries in the making. From the outset, *Bounceback* was designed as a long-term effort and its architects understood that it would evolve through many iterations. An innovative program when it began, *Bounceback* now operates in a very different intellectual environment, where landscape scale conservation is widely practised, both on and off reserve. Whether *Bounceback* exists in another 20 years or not, the approaches it pioneered, the collaboration it fostered and the processes it began, will continue to evolve. There will be opportunities through new programs to continue *Bounceback's* foundational work to build resilience across the semi-arid ranges of South Australia.

### THE WAY FORWARD

#### *NatureLinks* and the Trans-Australia Eco-Link

During the early 2000s the environment agencies of South Australia adopted a landscape scale approach to conservation management: *NatureLinks*. The core *Bounceback* footprint provided a basis for the development and priority setting for the Flinders-Olary *NatureLink*. *Bounceback* has been delivering on the *NatureLinks* philosophy and priorities since its inception and will continue to intertwine and meld into seamless programs.

Priorities will be driven by regional Natural Resources Management Plans, Biodiversity Strategies and continuing State and Federal government initiatives such as the National Wildlife Corridors Plan, and South Australia's No Species Loss Strategy.







R Sleep



The core elements of the program over the next 5 years will be:

**CONNECTING PEOPLE** to nature and to each other to care for, manage and share knowledge about biodiversity and production outcomes in the *Bounceback* footprint.

**PARTNERSHIPS AND INTEGRATION** across land tenure and organization type, individuals and communities to ensure a sustainable future for people and nature and shared goals.

**CONNECTEDNESS** of habitat via the improvement of condition and connectivity of core areas, by managing total grazing pressure, controlling high risk pests and enhancing biodiversity.

**BIODIVERSITY** protection of rare or threatened species in the *Bounceback* footprint. A holistic, coordinated approach is required for large scale threat abatement programs and implementation of recovery programs of specific species as indicators of overall ecological community health.

Everybody involved in *Bounceback* is looking forward to continuing the success of the program into the next 20 years.



