THE ARID RECOVERY PROJECT- ROXBY DOWNS – A 6000 HECTARE FENCE, ERADICATION AND MAINTENANCE PROGRAMME TOGETHER WITH A DEMONSTRATION OF TRAPPING TECHNIQUES

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Changes Since European Settlement

The arid land around Roxby Downs has undergone severe and dramatic changes since European settlement. More than 60% of the native mammal fauna has become locally or completely extinct including species as the Greater Bilby, Burrowing Bettong, Mulgara, Stick-nest Rat and Goulds Mouse. Ground nesting birds have also declined including the Kori Bustard, Plains Wanderer and Bush Thick-knee. Vegetation changes since European settlement are also evident in the Roxby region including a reduction in the abundance and distribution of Sandalwoods due to harvesting for incense early this century. Additionally, some sand dunes have become bare and mobile and many long lived trees and shrubs have shown limited recruitment and have been replaced by short-lived colonising species.

These changes since European settlement can be attributed to a range of factors including overgrazing and competition by rabbits and domestic stock and increased predation from the introduced cat and fox. It is estimated that there is approximately 1 cat per km² at Roxby Downs, feeding primarily on native species. Almost 1000 feral cats have been shot at Roxby Downs in the last decade and research has shown that they prey on 54 species of native vertebrate including 6 mammals, 34 reptiles, 13 birds and 1 frog. The stomach of one average-sized female feral cat at Roxby Downs was found to contain 24 painted dragons, 3 bearded dragons, 2 earless dragons, 3 striped skinks, 1 house mouse and a zebra finch, all representing a single meal. Feral cats at Roxby Downs are not noticeably larger than their domestic counterparts with the average weight only 3.8kg and the maximum 7.3kg. The diet of feral cats includes rabbits but after the arrival of Rabbit Calicivirus Disease, cats began to prey more heavily on native prey. Before the arrival of RCD 30% of cat stomachs contained rabbit compared to only 15% afterwards.

Rabbit numbers at Roxby Downs averaged between 150 and 600 per km² before the release of RCD. After the RCD release, rabbit numbers fell to approximately 1-10 per km² (these figures underestimate true rabbit density as they are derived from spotlight counts). The release of RCD and subsequent decline in rabbit numbers provided the stimulus for the formation of the Arid Recovery Project, a NHT funded project and joint initiative between WMC Resources, S.A. Department for Environment, the University of Adelaide and the Friends of the Arid Recovery Project. The objective of the project is to restore arid land in the Roxby Downs region to its pre-European state through eliminating introduced species such as the rabbit, cat and fox, allowing regeneration of arid vegetation severely limited by the presence of rabbits, and re-introducing locally extinct species. An important secondary aim is to demonstrate the benefits of industry/conservation partnerships and to research the restoration of ecological processes as the area is being rehabilitated.

The Reserve Area

The 60 square km project area is situated partly on the 180km² WMC Olympic Dam mine lease and partly on the neighbouring pastoral station also controlled by WMC. The Olympic Dam Mine, situated 5km to the south of the project, produces Copper, Uranium, Gold and Silver. A large variety of habitat types are present within the project area including chenopod shrublands, *Acacia* dunes, native pine and mulga sandplains, claypans and canegrass swamps and dunes. The mine lease has not been grazed by stock for over 12 years and the pastoral station section has been only lightly grazed in the past, mainly due to limited watering points. However, despite low stock grazing pressure, rabbits have inflicted severe damage on many areas within the exclosure. Warren density is high and the country is 'ideal' for rabbits with dunes for easy burrowing and grassy swales providing good feed.

Excluding and Removing Feral Animals

To date a 60 square km area of pastoral and mining land has been fenced to exclude rabbits, cats and foxes. A 34km long, 1.8m high netting fence was erected around the Reserve with a 60cm floppy top and 30cm foot netting. A small trial pen was erected to test the effectiveness of the fence as a barrier to rabbits and cats. Feral cats were trapped around the Reserve, placed inside the pen and videotaped trying to escape. 33 feral cats were tested until the final fence design was chosen. The most effective fence design included two electric wires and a 60cm floppy top. However, due to the extra effort and cost of the electric fence only one section of the Reserve was electrified, with more than ¾ of the Reserve not electrified. Despite this, no cats or foxes have gained entry to the Reserve since the fence was completed in 2000 suggesting that the non-electrified design is also successful.

Stage	no.cats tested	no. cats escaped	reason
30cm floppy top only	2	2	climbed up posts
30cm floppy with iron on posts	2	1	climbed over floppy top at corners
as above but extra floppy mesh on corners only	5	1	climbed over floppy top between posts
30cm floppy top, 2 electric wires (30cm and 135cm)	4	2	climbed over floppy top regardless of shock
60cm floppy top, no electric wires	10	2	sat 2/3 way up the fence and grabbed edge of floppy top
60cm floppy top, 2 electric wires	10	0	
Total	33	8	

The cost of the fence is approximately $10 000 per km for materials with a large portion of the cost due to the need for 30mm mesh to exclude rabbits. Standard 40mm mesh allows young rabbits to push through the holes in the netting so 30mm mesh had to be especially made to ensure rabbits were excluded. If rabbits do not need to be excluded and the non-

electrified design is adopted then costs can be reduced. The majority of labour used to erect the fence was provided by Green Corps at little cost to the project.

All rabbits, cats and foxes were gradually removed from the Reserve between 1997 and 2001. The Reserve is divided into 4 sections for ease of removal of feral animals. More than 6000 rabbits were removed by warren fumigation, trapping, shooting and posioning. Feral cats were removed using audio lures and soft leg hold traps as well as opportunistic shooting. The audio lures used by the project were designed by CALM in W.A. and emit a cat or bird-like sound which attracts the cats towards buried soft leg hold traps. 12 permanent audio lure sites are set around the outside of the Reserve fence to trap any cats which wander close to the Reserve fence. Due to the long distance over which the traps are set (34km perimeter fence), the traps are checked remotely using radio-telemetry. All traps can be checked from one central location using a radio receiver. The radio signal becomes faster when the trap has been set off. In 2001, 19 feral cats and 25 foxes were captured using this technique compared to 16 cats and 22 foxes during 2002. This method has been found to be effective but can be time consuming with traps needing to be checked daily even on weekends. Shooting around the perimeter fence is also conducted on an opportunistic basis.

Restoration of Ecological Processes

An important aim of the project is to restore locally-extinct native fauna and flora. Four threatened mammal species have been re-introduced including the Greater Bilby, Burrowing Bettong, Western-barred Bandicoot and Stick-nest Rat. All re-introductions are progressing positively with no deaths from introduced predators. Ongoing research and monitoring programs are an integral part of the Arid Recovery Project. The main focus for research is to determine natural ecological processes and how they are restored when rabbits, cats, foxes and stock are removed. More than 500 monitoring sites have been established to determine the response of native vegetation, mammals and reptiles to the removal of rabbits, cats, foxes and domestic stock. Current results indicate a significant increase in small native mammals such as the spinifex hopping mouse inside the Reserve and increased vegetation cover. Initial vegetation results have been promising with recruitment of many perennial trees and shrubs already recorded, including Umbrella Wattle (*Acacia ligulata*), Sticky Hopbush, (*Dodonaea viscosa)*, Mulga (*Acacia aneura*), Dead Finish (*Acacia tetragonophylla*), Spiny Wattle (*Acacia victoriae*), Silver Cassia (*Senna artemisiodes)* and Bullock Bush (*Alectryon oleifolius*).

Research will help land managers find a balance between production and the preservation of arid lands. For example, as well as moral reasons, restoring native wildlife such as bilbies may have important ecological benefits. Studies at the project have shown that when bilbies dig for food they provide an important catchment area for seeds and help seedlings become established. Although bilbies have been replaced by rabbits in much of the arid zone, comparisons between the two species have found that rabbit scratchings are shallower so they don't catch as many seeds and often don't provide the right environment for germination. Bilbies are also largely insectivorous so they don't compete with stock for food and may even help reduce insect numbers which cause damage to feed (e.g. locusts etc). Replacing rabbit with bilbies could lead to benefits for both production and conservation.

The Friends of the Arid Recovery Project

In order to coordinate the community involvement and support that is essential for the continued success of the Arid Recovery Project, the Friends of the Arid Recovery Project was established in 1998. The Friends group provides in kind volunteer labour and during 2002 this labour was valued at more than $85 000.

Membership has now grown to nearly 200 households across Australia and overseas, and in addition to the general public, includes primary, secondary and tertiary students, local pastoralists and soil boards, National Parks Friends groups and employees, 4WD Clubs, Australian Geographic, and local businesses. Members of the Friends group receive regular updates on Project progress, as well as activities including open days, BBQ's, organisation of fundraising events, and opportunities to assist with endangered species monitoring and feral animal control. Members are kept informed of project progress via regular newsletters, and play a role in protecting Australia's endangered species and unique arid environment. If you would like to become a member of the Friends of the Arid Recovery Project or would like more information on the project, please contact the Project Coordinator on 0886 718282 or by email on arid.recovery@wmc.com