Australian Wildlife Conservancy

KARAKAMIA WILDLIFE SANCTUARY Jan-Nov 2007

Introduction

Karakamia Wildlife Sanctuary owned by the Australian Wildlife Conservancy (AWC) covers 275 ha of Jarrah forest in the southwest of Western Australia, east of Perth. All key habitats found within the Jarrah forest vegetation complex, including the Jarrah forest itself, Marri woodland, Wandoo woodland, granitic heathlands and shrublands, and riparian (river) zones are found within the sanctuary.

Established in 1992, Karakamia Wildlife Sanctuary was the first property acquired by AWC. The primary goal of the sanctuary was to re-establish the medium-sized mammals that had either declined significantly in the region, or had become regionally extinct. The key to the success of this project was the protection and effective management of critical habitat, and the exclusion of all feral animals with a 9 km vermin-proof fence surrounding the entire property. After initial surveys to determine species present, six mammal species were re-introduced to Karakamia between1994-1998. These included the Quenda (September 1994) Numbat (December 1994), Woylie (January 1995), Western Ringtail Possum (August 1995), Quokka (October 1996) and Tammar Wallaby (November 1998; Table 1). Populations of other species already present such as the Western Brush Wallaby and Brushtail Possum were also supplemented (Table 1).

Monitoring of flora and fauna has been ongoing since 1992. Some species have responded so well to the feral animal exclusion within the sanctuary, that by December 2005 over 660 mammals (including 547 Woylies) had been translocated from Karakamia to a number of other suitable locations such as Paruna Wildlife Sanctuary (AWC), Avon Valley and Kalbarri National Parks and Cervantes (Department of Environment and Conservation (DEC); Table 2).

Table 1: Summary of mammals released at Karakamia.

Year	Woylie	Quenda	Numbat	Ringtail possum	Quokka	Tammar	BT Possum	Brush Wallaby
1994	3	6	3				8	2
1995	15	21		5				
1996	5	4	1	6	3			
1997	1	6						
1998	4			5	1	13		
1999	2	1	2	5				
2000				4				
2001	2			5				
2002	1			12				
2004	7							
Total	**40**	**38**	**6**	**42**	**4**	**13**	**8**	**2**

Source of Animals

Woylies – Dryandra Woodland, wildlife carers.
Quenda – Sites around Perth metropolitan area, wildlife carers.
Numbats – Dryandra Woodland.
Ringtails – Busselton, hand reared from wildlife carers, development clearing.
Tammars – Tutanning Nature Reserve.
Quokkas – Big Swamp Wildlife Park (Collie origin).
Brushtail Possums – wildlife carers (Perth Hills origin).

Brush Wallabies –wildlife carers (Perth Hills origin).

Table 2: Summary of mammals translocated from Karakamia.

Date	Destination	Species	No. translocated
1996	Tutanning Nature Reserve	Numbat	1
1997	Perth Zoo	Chuditch	1
1999	Genaren (NSW)	Woylie	12
2000	Paruna Sanctuary	Woylie	70
2000	Paruna Sanctuary	Quenda	32
2001	Paruna Sanctuary	Woylie	52
2002	Paruna Sanctuary	Woylie	40
2002	Avon Valley National Park	Woylie	41
2002	Perth Zoo	Numbat	1
2004	Paruna Sanctuary	Woylie	49
2004	Paruna Sanctuary	Quenda	13
2004	Paruna Sanctuary	Brushtail Possum	68
2004	Avon Valley National Park	Woylie	30
2004	Julimar Conservation Reserve	Woylie	15
2004	Kalbarri National Park	Woylie	28
2005	Kalbarri National Park	Woylie	40
2005	Cervantes	Woylie	34
2005	North Kalgarin	Woylie	40
2006	Paruna	Woylie	96
2006	Paruna	Quenda	5
Total			**668**

Previous Reports

Individual reports as part of on-going monitoring protocol between AWC and DEC for each of the six reintroduced mammal species have been prepared every six months since release. After discussions with DEC and AWC, it was determined that these translocated species reports be replaced with a single annual report for each sanctuary reflecting population establishment and trends over time.

Methods

Spotlighting

During this period a spotlighting drive transect was conducted at Karakamia incorporating the different habitats within the sanctuary. The spotlight transect was established for comparison with other AWC sanctuaries and DEC reserves. This transect is 9 km long and takes approximately an hour to complete. A map of the route is in AWC's Karakamia Wildlife Sanctuary 2005 report to DEC. It was conducted on three consecutive nights every three months. Spotlighting has been the principle monitoring technique for Karakamia as it is less intrusive and in some ways more effective than trapping within the sanctuary, where high capture rates and trap disturbance by some mammals, particularly Woylies, reduce the effectiveness of the trapping for species other than Woylies.

Trapping

As a result of the dramatic decline detected in many Woylie populations in the south-west of WA, AWC is involved in Woylie Decline Research co-ordinated by Dr Adrian Wayne (DEC Manjimup). This involved the establishment of a grid of 7 x 7 lines of cage traps (total 49) at Karakamia, since

reduced to 5 x 6 lines of six traps (total 30) placed 50 m apart and trapped for four consecutive nights. Similar grids have been set up at other known woylie populations to enable comparisons between the different locations. These grids at Karakamia were trapped every two months from January to July 2007. Pit trapping and another Woylie grid trap is also to be completed this year (late November) but will not have been completed in time for this report and will appear in the 2008 report to DEC.

Table 3: Trapping effort at Karakamia in 2007.

Trap Type	No. traps per night	No. nights	Total
Tammar Traps	1x19 1x 20	2	39
Sheffield	3x24 16x30 2x40	21	632
Large Elliott	3x5	3	15
Medium Elliott	3x5	3	15
Total			**701**

Opportunistic observations
Observations of interest are noted and recorded by AWC during routine sanctuary work, including evening spotlight tours which are regularly conducted for visitors to the sanctuary. This can include unusual sightings, calls, scats, tracks and breeding events that might not be detected by other monitoring techniques.

Vegetation
Monitoring of vegetation is undertaken by photographic record of 11 established photo points at six monthly intervals, which have been conducted since 1992. These photographs are archived by AWC at Karakamia. Intensive species counts at all quadrats are undertaken every five years. An extensive field herbarium has been established and updated, with over 300 specimens stored at Karakamia.

As part of the Woylie Decline Research, truffle surveys were conducted in September 2006 to determine abundance and species of truffles available for the Woylie at Karakamia.

Two adjacent 10 x 10 m vegetation quadrats were established in 1994. One has a 1 m high fence with a mesh skirt to exclude grazing pressure from Western Grey Kangaroos, Western Brush Wallabies and Tammar Wallabies (Brushtail Possums and possibly Woylies are able to gain access); the second is unfenced. The diversity and abundance of species in both quadrats is recorded annually.

Results

Spotlighting
Results for the previous three years are displayed in Figure 1 below.

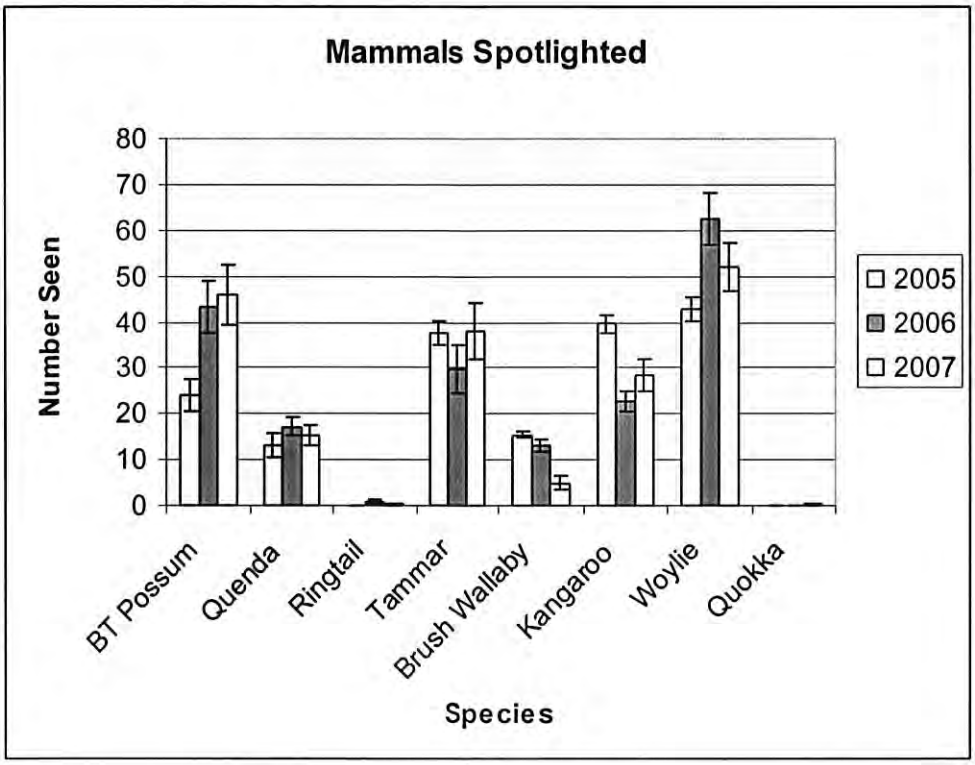

Figure 1: Mammals sighted on 9 km spotlight drive transect at Karakamia.

Trapping

Results from cage and Elliott trapping conducted by AWC at Karakamia in 2007 (until beginning November) are outlined in Table 4 and Figure 2 below. Woylies continue to dominate captures.

Table 4: Trapping results at Karakamia in 2007.

Species	No. trapped
Woylie	459 (inc. 307 retraps, and 17 unprocessed)
Brushtail Possum	11 (inc. 3 retraps)
Quenda	86 (inc. 34 retraps and 25 unprocessed)
Tammar	2
Mardo	1
Bobtail	1
King Skink *Egernia kingii*	3
Total Animals Trapped	**563**
No. Trap nights	**701**
% Trap Success	**80.31%**

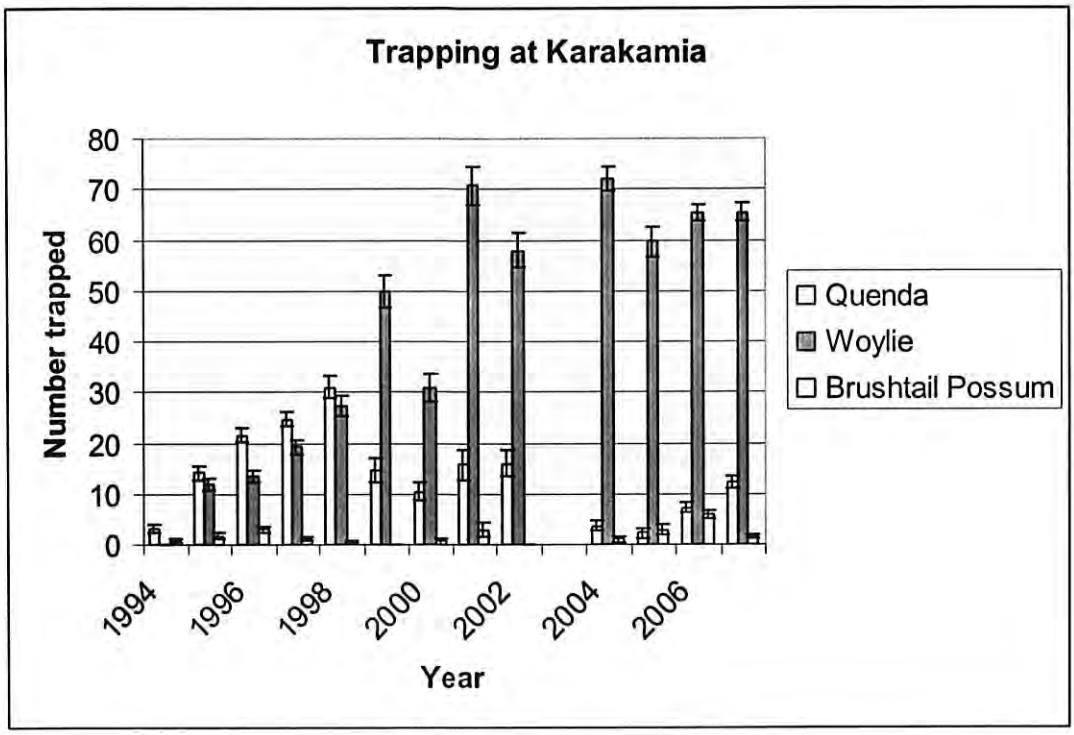

Figure 2: Mammal trapping at Karakamia from 1994 – 2007. Note that no standard trapping was conducted in 2003, both Sheffield and Elliott traps were used prior to 2000 and Sheffields only from 2000.

Discussion

Woylies

The number of Woylies spotlighted continued to be high but dropped to an average of 51 in 2007 after the translocation of animals to Paruna Wildlife Sanctuary last year.

Grid trapping as part of DEC's Woylie Decline Research was conducted in January, March, May and July resulting in the capture of 350 woylies consisting of 71 individuals and 279 retraps. The condition of a number of individuals was therefore tracked thoughout the year.

Kerry Rodda (Murdoch University PhD student) has been investigating the diet of Woylies as part of DEC's Woylie Decline Project. She has found a significantly lower number of truffles in Karakamia compared to the other sites in the Warren Region (K. Rodda pers. comm.)

During 2007 fifty four percent of females captured in the Woylie Decline Research grid were carrying a pouch young. There were 47 individuals recorded on the grid including 12 new individuals (25%). For some comparison, ten years ago in 1997 a total of 93% of females had pouch young and 46% of individuals captured that year were new animals (over the whole sanctuary). Woylie recruitment at Karakamia is probably lower currently as a result of lower food and shelter resource availability, ie higher intra-specific competition. Translocation of Woylies from Karakamia is a priority to maximise further Woylie recruitment.

Quenda

The spotlight drive transect showed a similar number of Quenda in 2007 compared with 2006 and an increase in the number trapped. Due to the high competition with Woylies for traps it remains difficult to trap Quenda. High intra-specific competition rates among Quenda are still evident with observations of individuals with scars and missing fur and tails.

Numbats
No numbats were sighted at Karakamia in 2007.

Quokka
Ten Quokkas were sighted during 2007 including five sightings along the stream and five in the Rosedale Block (likely to be 1-2 individuals). As mentioned in previous reports, this population would benefit from the addition of mainland Quokkas. DEC were approached in early 2007 to source animals from southern WA.

Tammar Wallabies
Attempts were made to trap Tammar Wallabies in 2007 to translocate them to Paruna Wildlife Sanctuary but despite trialling different traps and bait types, Woylies dominated the traps and only two Tammar Wallabies were captured. Attempts will continue in 2008.

Young Tammar Wallabies have been observed in recent weeks emerging from the pouch and becoming independent. Results from the vegetation quadrat continue to indicate that grazing within the sanctuary is having an adverse effect on some species of plants. Increasing numbers of Tammar Wallabies within the sanctuary will contribute to increased grazing pressure thus translocation of some individuals off the sanctuary to suitable locations will occur in 2008 if they can be successfully captured.

Ringtail Possums
Twenty Ringtail Possums were sighted during this period; two during the spotlight drive transect and a further fifteen opportunistically during sanctuary work. Three evenings of targeted Ringtail Possum searching were conducted in May when 11 were sighted. Two of these were captured by hand and processed. Both were young females in reasonable condition. Attempts were also made to capture a mother and young at heel that had taken up residence in a "Cockatoo" nesting box. The young at heel was later found dead after an exceedingly hot day in January.

Other species recorded and opportunistic observations
Brushtail Possums were noted in high numbers again in 2007. Spotlighting data showed an increase in 2006 and again in 2007. Staff and visitors have observed many young during spring this year. Suitable shelter is obviously in limited supply as staff have noted possums sheltering in a variety of locations, including any objects left on the office verandah and under BBQ covers in the full sun. A translocation proposal has endorsed by DEC to take transfer possums from Karakamia to Paruna Wildlife Sanctuary in 2008.

Kangaroo numbers were slightly higher than last year and an ongoing culling program implemented as per Damage Control Licence No. SW 3530.

The number of Brush Wallabies spotlighted in 2007 was lower than in previous years but this is likely to be due to long grass in the paddock all year making spotting animals more difficult than in previous years, rather than a true decline. Staff have observed them in all the usual locations throughout the year.

Mardos (*Antechinus flavipes*) and their scats have been found on a number of occasions this year in the Visitors Centre, Office and Rosedale House and one was trapped along the creekline.

Amphibians
Six species of frog were recorded on the spotlight transect in 2007: Slender Tree Frog (*Litoria adelaidensis*), Banjo Frog (*Limnodynastes dorsalis*), Quacking Frog (*Crinia georgiana*), Glauert's

Froglet (*Crinia glauerti*), Bleating Froglet (*Crinia pseudinsignifera*) and Motorbike Frog (*Litoria moorei*). While Lea's frog (*Geocrinia leai*) was not detected during the transects they were heard by staff during winter calling near the creek. Once the winter rains commenced the Quacking frogs had a very successful breeding season with very strong calling and tadpoles noted by the walk trails during winter.

Reptiles
A number of Carpet Pythons (*Morelia spilota*) were sighted during the year and a Gould's Hooded Snake (*Parasuta gouldii*).

Vegetation
The results showed that the plant diversity between the two vegetation quadrats was very similar, though there was evidence of extensive grazing on some species in the control plot, especially the reed *Lepidosperma leptostachyum*, which had extensive flowers in the fenced exclusion plot but no flowers in the unfenced control plot. The fresh shoots on the prostrate Woolly Bush (*Adenanthos cygnorum chamaephyton*) was grazed heavily in the control plot but not in the exclusion plot. A tiny everlasting *Waitzia* was in bud in the exclusion plot in huge numbers but not present in the control plot. The native grass *Neurachne alopeuroides* was present in both plots but only flowering in the exclusion quadrat. The other observation of note was that 5% of the exclusion quadrat was noted as bare ground but 15% in the control plot.

This evidence of heavy grazing, especially the lack of flowers in some species, suggests that grazing pressure is high in the sanctuary. This is probably due to the lack of good winter rainfall. As a consequence AWC plan translocate a portion of the population of some species such as the Woylie, Tammar Wallaby and Brushtail Possum to other suitable locations in the next couple of years.