Australian Wildlife Conservancy

KARAKAMIA SANCTUARY July-Dec 2005

Introduction

Karakamia 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 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 between 1994-1998. These included the Quenda (Sept 1994) Numbat (Dec 1994), Woylie (Jan 1995), Western Ringtail Possum (Aug 1995), Quokka (Oct 1996) & Tammar Wallaby (Nov 1998). Populations of other species already present such as the Western Brush Wallaby and Brushtail Possum were also supplemented. See table 1 for details of mammals released at Karakamia. 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 Dec 2005 over 560 mammals (including Woylies (the majority), Quenda & Brushtail Possums) had been translocated from Karakamia, to a number of other suitable locations such as Paruna Sanctuary (AWC), Avon Valley National Park, Kalbarri National Park and Cervantes (CALM). Table 2 shows a summary of animals translocated from Karakamia.

Table 1 - Summary of Mammal Releases at Karakamia

Year	Woylie	Quenda	Numbat	Ringtail	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, many from carers.
Quenda – Sites around Perth metropolitan area, many from carers.
Numbats – Dryandra
Ringtails – Busselton (mostly hand reared from Carers),
Tammars – Tutanning Nature Reserve
Quokkas – Big Swamp Wildlife Park (Collie origin)
Brushtail Possums – Carer – Perth Hills origin
Brush Wallabies – Carer – 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 NP	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
Total			**567**

(Total Woylies translocated = 451)

Previous Reports

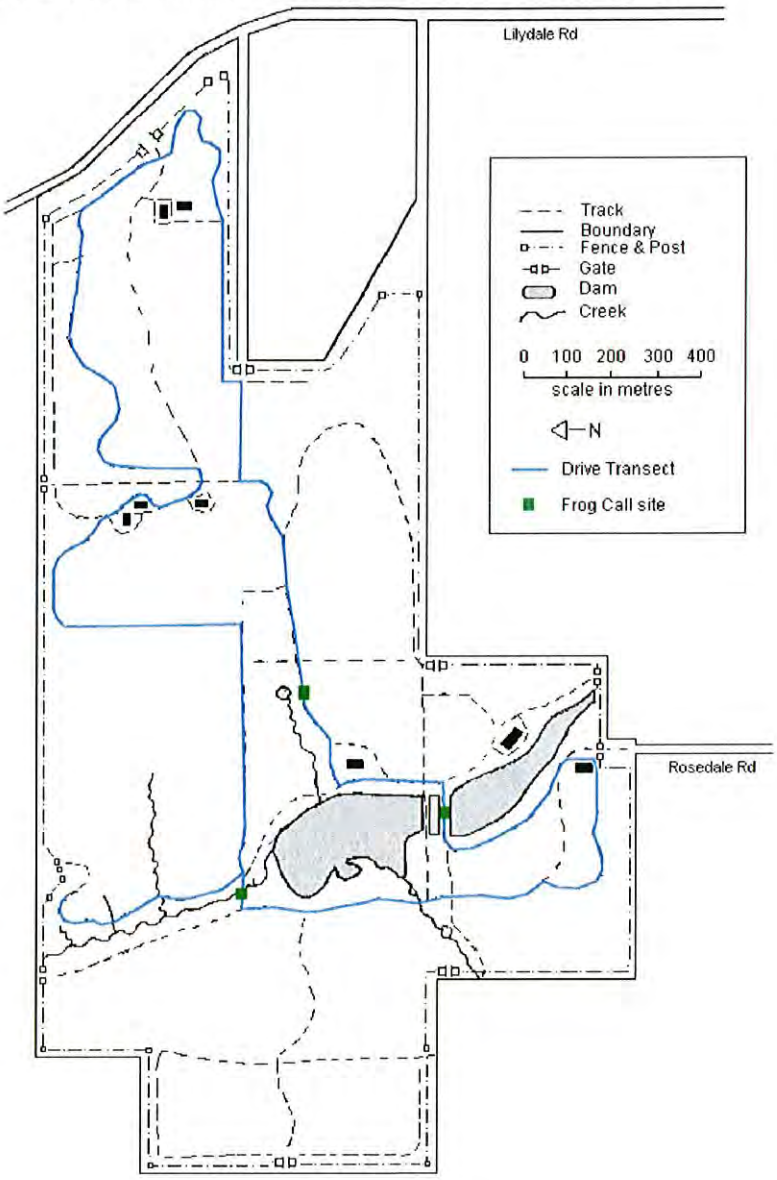
Individual reports as part of on-going monitoring protocol between AWC & CALM (Department of Conservation and Land Management) for each of the six reintroduced species have been prepared every six months since release. After discussions with CALM & AWC staff, it was determined that these translocated species reports be replaced with an overall report for each sanctuary reflecting overall patterns and trends over time.

Methods

Spotlighting

During this period a spotlight drive transect was implemented at Karakamia incorporating the different habitats within the sanctuary. The transect was set up to standardise spotlight monitoring technique so the data is comparable with other locations including other AWC sanctuaries and CALM reserves. This transect is 9 km long and takes approximately an hour to complete. The route is outlined on Map 1. It is conducted on three consecutive nights every three months. A similar drive transect has also been set up at Faure Island, Mt Gibson & Paruna Sanctuaries. Spotlighting is the principle monitoring technique for Karakamia Sanctuary as it is less intrusive and more effective than trapping within the sanctuary, where high capture rates and trap disturbance by some small mammals, particularly Woylies, reduce the effectiveness of the trapping.

Map 1 – Karakamia Sanctuary – Drive Transect Route



Trapping

Trapping using Sheffield Wire Traps targeting Woylies was also conducted during this period to provide CALM with Woylies for translocation to a number of suitable locations that include Narrogin, Cervantes & Kalbarri National Park.

Observations

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

Exclusion Quadrat

Two 10x10m quadrats are set up side by side, one has a 1m fence and skirt surrounding the quadrat to remove grazing pressure from Western Grey Kangaroos, Western Brush Wallabies & Tammar Wallabies. The skirt would also keep Quenda out. Brushtail Possums and possibly Woylies could gain access into this quadrat. The second Quadrat is unfenced and all grazing animals within Karakamia could access this site. The diversity & abundance of species in both quadrats is recorded.

Results

Spotlighting

The first drive transect conducted 22-24/11/05, seven species of mammals were recorded. This included Western Grey Kangaroo, Tammar Wallaby, Woylie, Quenda, Brushtail Possum, Ringtail Possum & Western Brush Wallaby. As seen in the graph below, high numbers of mammals were recorded during the transect, averaging 173 mammals per night (SE= 1.76) or 24.9 mammal sightings/km (SE = 0.23).

Figure 1 – Mammals sighted on Drive Spotlight Transect at Karakamia Sanctuary 2005

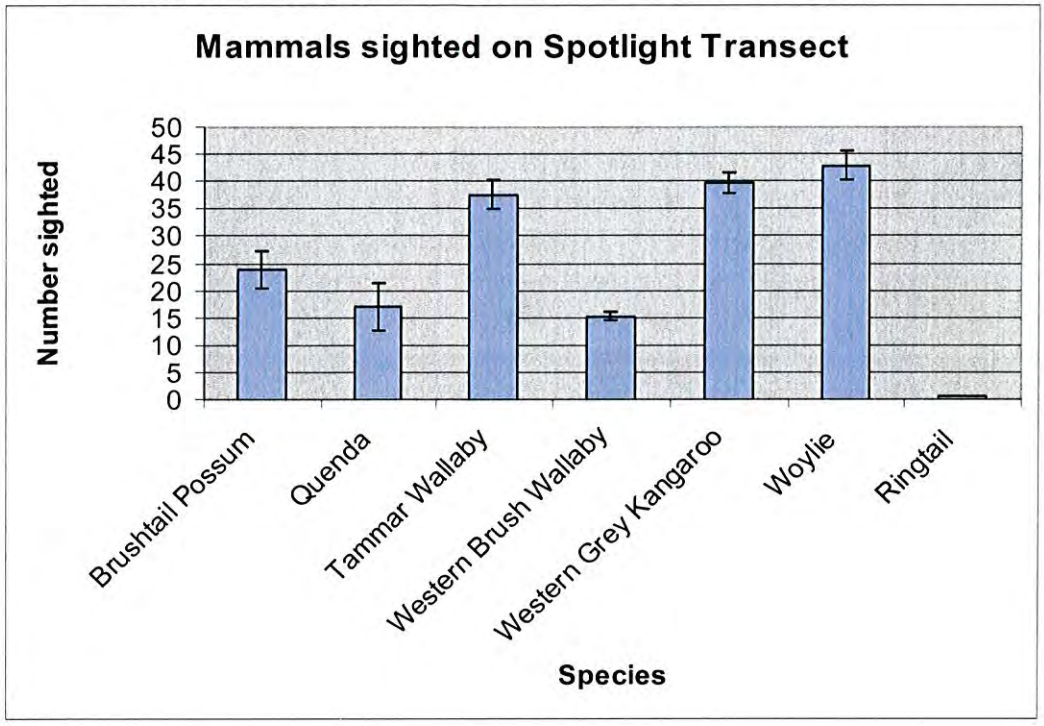


Figure 2 – Woylies spotlighted at Karakamia 1994-2005

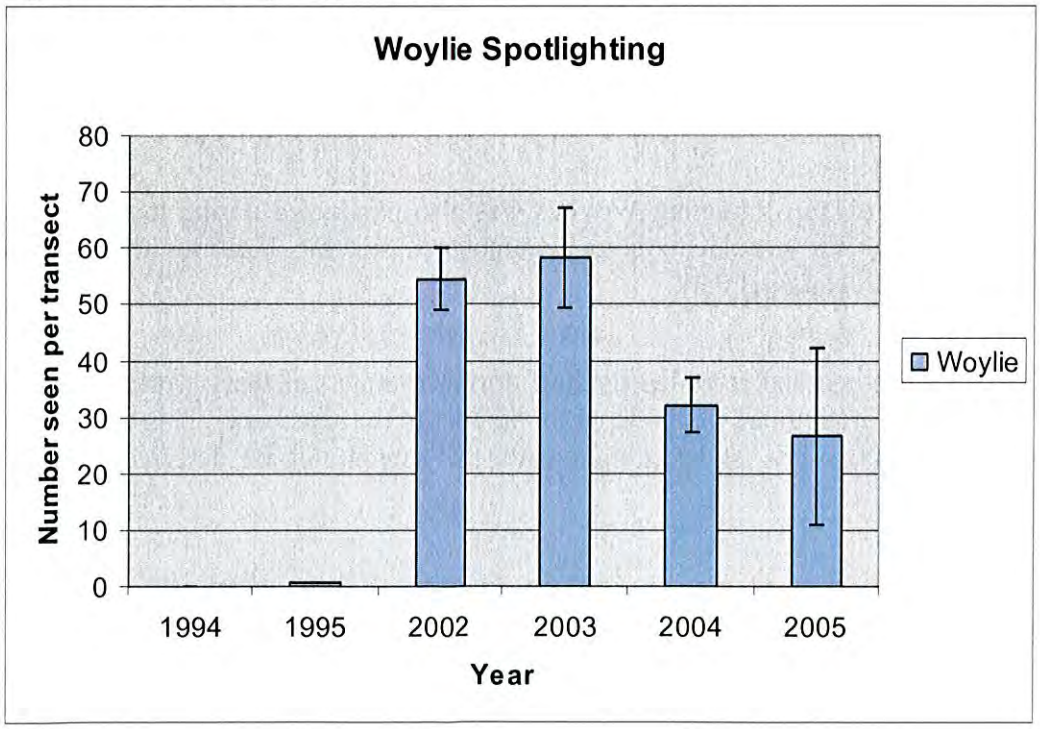
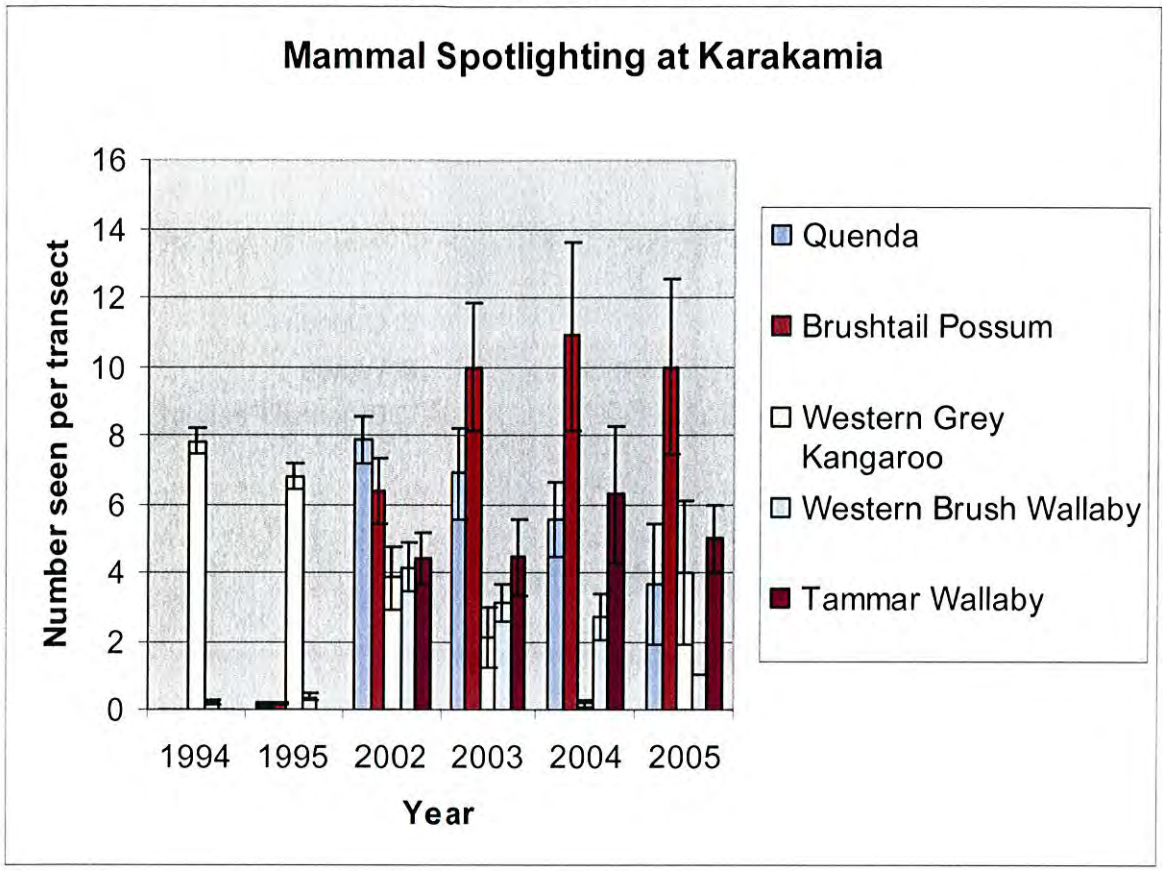


Figure 3 – Other mammals spotlighted at Karakamia 1994-2005



Trapping

As seen in Table 3, a high trap rate with four species of mammal recorded during trapping on 31/8 for Woylies suitable for translocation. The trap success rate was 64.8%

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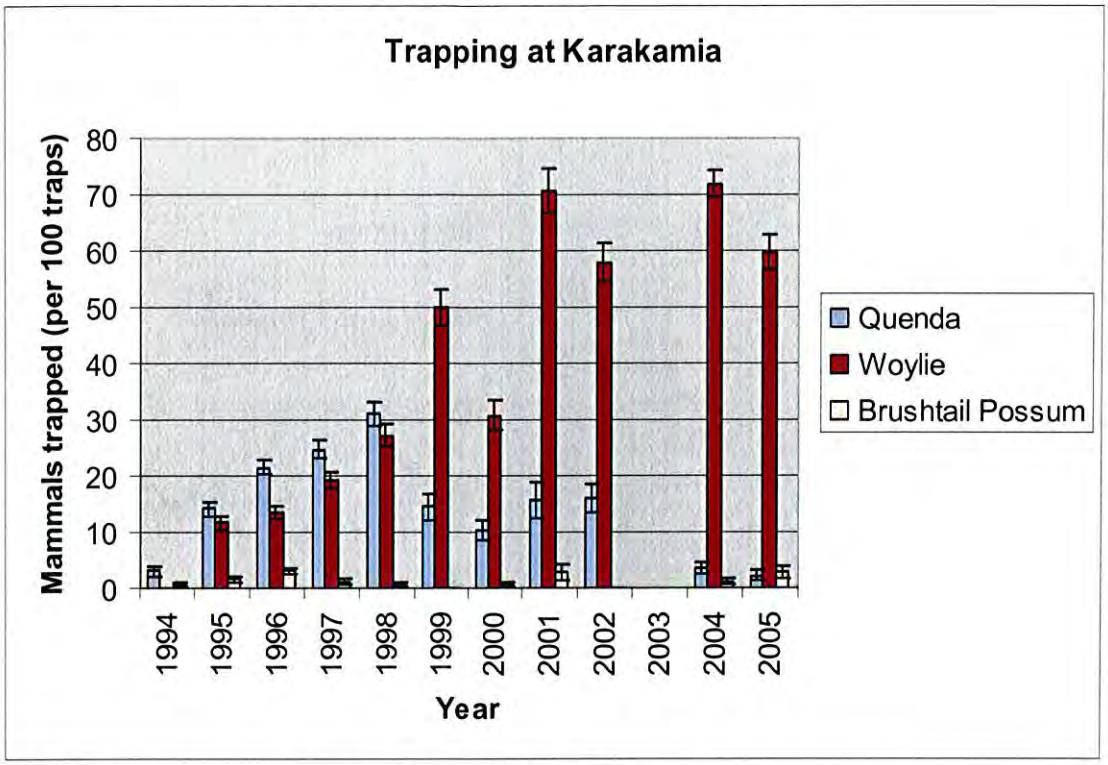
Table 3 – Trapping July – Dec 2005

Species	No trapped
Woylies	160 (114 translocated)
Brushtail Possums	8
Quenda	6
Quokka	1
No Trap nights	270
% Trap Rate	64.8%

Figure 4 – Mammal trapping at Karakamia from 1994-2005



NB: Standard trapping was not conducted in 2003.
NB2: Both Sheffield & Elliott traps were used prior to 2000 (Sheffields only from 2000).

Vegetation – Exclusion Quadrat

The results showed that the plant diversity between the two quadrats is very similar, though everlastings were not evident in the unfenced quadrat, which were abundant in the fenced area. The reed *Lepidosperma leptostachyum* that was rather common in both quadrats, was also noted to be heavily grazed in the unfenced area with no flower heads. *Dryandra nivea* was present in the unfenced quadrat in quite high numbers but not in the fenced area. This could be natural variation or it may be that digging animals like the Woylie & Quenda help with this dispersal of this species. There also appeared to be less *Hibbertia hypercoides & Bossiea pulchella* in the unfenced area though both species were very common in both quadrats.

Discussion

Translocated Species

Woylies

Trapping was conducted at Karakamia overnight 31/8/05 to provide CALM with Woylies suitable for translocation. One hundred and fourteen Woylies were translocated in 2005 taking the total Woylies translocated from Karakamia to 451. The results from the first drive transect on 22/11/05, 23/11/05 & 24/11/05 (post trapping) revealed an average of forty three (SE = 2.65) Woylies each night over the 9km transect. Figure 2 also shows high numbers of Woylies along the walk trail though numbers have declined in 2004/2005. This is likely to be due to a change in policy regarding pre-feeding the walk trail with oats rather than a decline in Woylie numbers. Prior to late 2003, the walk trail was regularly pre-fed with oats before the evening tours along part of the walk trail to allow visitors to interact with some rare wildlife, especially Woylies. Wildlife feeding can be a valuable tool in promoting the conservation ethic to visitors to the sanctuary but research has indicated that wildlife feeding can be detrimental to populations so this policy was changed.

Spotlighting and trapping data still indicate a high level of Woylies within the sanctuary and a further translocation of Woylies to Paruna is planned for June 2006.

Quenda
An average of seventeen (SE = 4.36) Quenda were observed during the drive transect. Six Quenda were also trapped during the Woylie trapping event on 31/8/05.

Figure four shows mammal trapping at Karakamia since 1994. It is evident that Quenda have declined with very low trapping rates in 2004 & 2005. It was assumed by sanctuary staff that this was due to the very high rates in Woylie trapping but figure four shows that comparably high trap rates in 2001/02 did not show such low numbers of Quenda. This decline in Quenda is also evident in the spotlighting data shown in Figure 3. Observations of frog calls indicate that two species of burrowing frog *Helioporus barycragus* & *Pseudophyryne guentheri*, a known Quenda food source have disappeared from the sanctuary and with high competition from Woylies which have an overlapping diet, may be a contributing factor in the decline in Quenda numbers within the sanctuary. High competition rates among Quenda in the sanctuary are supported by observations from staff of individuals with scars, missing fur and missing tails. Larger slow individuals were very evident last summer, observed in the in poor condition out feeding in the middle of the day. These results would further support the translocation of more Woylies from the sanctuary.

Numbats
Numbats have not been sighted during this period, the extended winter season with wet mild days may be a contributing factor in reduced sightings.

Quokka
One Quokka was trapped during the Woylie translocation trapping event on 31/8/05. It was a founding female from 1996 weighting 3.3kg with a pouch young. Quokkas were not observed during the drive transect or the Ringtail search on 27/7/05, though Quokkas have often been seen in similar habitat in previous reporting periods.

Tammars
During the drive transect, high numbers of Tammars were recorded each of the three nights with an average of thirty eight (SE = 2.60). The Tammars were concentrated in the open paddock areas. As Tammar numbers are increasing to high levels in the sanctuary, consideration should be given to translocating some individuals to Paruna to support that population in the near future. These high numbers of Tammars are supported by spotlighting results seen in Figure 3 which shows an increase in Tammar sightings since 2002. Results from the vegetation quadrat indicate that grazing within the sanctuary is having an adverse effect on some species of plants particularly the everlastings and reeds. Increasing numbers of Tammar Wallabies within the sanctuary will contribute to increased grazing pressure.

Ringtail Possums
Six Ringtail Possums were sighted during this period. On 27/7/05, staff conducted a search for Ringtail Possums for approximately three hours in known Ringtail habitat resulting in three sightings including one that was opportunistically captured. One was opportunistically captured on 22/9/05 whilst staff were removing exotic pine trees. Two Ringtails were observed during the new drive transect that took place 22/11/05, 23/11/05 & 24/11/05.

Other Species recorded
Brushtail Possums were noted in high numbers during this reporting period. Thirty two were recorded during the Ringtail search and an average of twenty four (SE = 3.46) were noted during the drive transect. Spotlighting shown in Figure 3, shows significantly higher numbers recorded in 2003, 2004 & 2005. Early data from 1994, 1995, hardly detects Brushtails Possums during a walk. It was noted during November that the flowering of Bull Banksia *Banksia grandis* & Blackboy *Xanthorrhoea preissii* were very poor within the sanctuary, with the majority not having many or

any flowers present compared to similar areas outside the sanctuary which had great displays of both species. They are both known favourite foods of the Brushtail Possum. Further translocations of this species from the sanctuary to other suitable locations during 2006 should be considered.

High numbers of Western Grey Kangaroos were recorded each night along the drive transect with an average of forty per night (SE = 1.85). Interestingly this is not reflected in Figure 3, the walk transect which shows a decrease in kangaroo sightings. This is likely to be a result of increased suitable habitat available to kangaroos in recent years with the addition of new grazing areas with the expansion of the sanctuary including two further paddocks areas since 1995. The majority of kangaroos noted by staff are mostly in these paddock areas (which are covered in the new drive transect).

Reasonable numbers of Brush Wallabies were also noted with an average of fifteen (SE= 0.67) per night during the new spotlighting transect. Brush Wallaby numbers have increased significantly since 1995 on walk trail but have declined in the past two years as seen in Figure 3. Like the kangaroos, this is likely to be as a result of more suitable habitat now being available to them. The increased numbers of Tammar Wallabies may also reduce food resources available to them.