

THE HIGHS AND LOWS OF ENDANGERED SPECIES BREEDING

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Introduction

Both Kanyana's Endangered Species breeding programs were unplanned. The plight of the Western Barred Bandicoot (*Perameles bougainville*) and the Bilby (*Macrotis lagotis*) was certainly on Conservation & Land Management's (CALM) agenda when unusual circumstances triggered the start of the captive breeding program.

Kanyana's Western Barred Bandicoot (Marl) breeding program began when my daughter Fleur, who was at the time working at Perth Zoo, was asked to look after a 30 gram Western Barred Bandicoot. Following the successful raising of this animal, Dr Tony Friend from CALM was instrumental in creating a pilot project to establish whether these animals could be bred in captivity.

It was also necessary to determine -

- protocols for captive husbandry
- protocols for captive breeding
- whether the animals would breed in captivity;
- whether they could be safely transported with pouched young from their present range on Bernier and Dorre islands;
- whether different island populations would breed with one another and whether this would affect their fecundity, ie whether inter-island breeding would produce lower litter sizes than within-island breeding.

Another issue was that it was not known how long the two island colonies had been isolated and whether they had evolved into different species.

Three years later in 1994, the Western Barred pilot breeding project began by which time our first Western Barred was too old to breed.

Kanyana's Bilby (*Dalgyte*) breeding program began with the arrival of a severely dehydrated, orphaned female from Cotton Creek in the North West of WA. Six months later Kanyana was asked to temporarily house a male from CALM's Broome facility. Bilbies being bilbies, the female was soon discovered to have a pouched young. A better enclosure for the pair as well as an enclosure for the baby. CALM had been considering a breeding program for Bilbies and so this program began with these three animals in 1997.

Kanyana's association with CALM is rather unique in the area of wildlife care. Our 11 year association encompasses endangered breeding, wildlife rehabilitation and education. It's been a mutually beneficial relationship which also includes the benefits of CALM's insurance cover for our 120 volunteers. Kanyana is proud to be associated with CALM's pioneering *Western Shield* program which is the world's biggest campaign against feral predators, encompassing an area more than half the size of Tasmania. This highly effective programme has three elements: fox baiting on a scale never before attempted; feral cat control and, as predators are controlled in target areas, returning native animals to former habitats..... which is where Kanyana fits in.

Kanyana's animals are sent to Dryandra Woodland which is a predator-proof, fenced area of 20 hectares 300 kms south east of Perth. The *Return to Dryandra* project is yet another component of the *Western Shield* program.

WESTERN BARRED BANDICOOTS

Where to begin ?

As the Western Barred breeding program was the first of its kind in the world, there was no instruction manual; *we're writing the manual as we go ! Detailed record keeping is essential.*

A major consideration was the animals' likely wild diet, their habitat and the climatic conditions they were used to on their islands homes.

Handling techniques for these very easily stressed bandicoots were a particular concern; Western Barreds have been known to die in the hand from stress which is why dark pouches are used for handling all mammals.

The design of the WBB enclosures had to consider factors such as

- isolation of animals to minimise handling
- interconnecting doors between individual enclosures to facilitate pairing
- an interior walkway within the enclosure to allow staff access to the individual enclosures without the risk of stepping on these small bandicoots in their leaf litter nests
- hinged, external feed trays to allow feeding without entry to the enclosures
- electricity supply for use of heating pads which were necessary during the initial transitory acclimatisation period

Enclosures were provided by Kanyana, CALM and the Threatened Species Network.

Diet

The fact that Western Barreds are omnivores made the task a bit easier. Kanyana began by giving the animals a variety of what was thought to be suitable foods. Generally they are given what's termed *normal zoo fare*; they particularly relish mealworms, crickets and moths. Prior to release the live food content of their diet is increased. It was a pleasant surprise, and a relief, to find that as soon as the animals were put into the wild situation they immediately began chasing moths and beetles.

Ominvore pellets created by an animal nutritionist at Glen Forest Stockfeeders (WA) make up a significant percentage of their diet and are the only source of artificial food provided at the Dryandra release site.

All food is weighed-in and weighed-out with consumption figures recorded each day as this is a vital monitoring tool to quickly alert us to problems; the first sign of problems or sickness is a drop in food consumption.

Breeding

The numbers of breeding animals were increased gradually until in 2002, at the height of the program, Kanyana had 20 breeding pairs.

The animals bred well, most commonly with twins. It was found that instead of only breeding for six months as was the case on their home islands, in captivity they bred all the year around because of the continuous supply of good food.

Kanyana successfully bred 52 animals with animals being dispersed to Dryandra WA and Roxby Downs SA. The pairings were controlled by Dr Tony Friend.

It was discovered that these animals had the shortest gestation of any mammal in the world - 12.5 days.

The Lows

Early in 1999, in one devastating episode, 11 Western Barreds died of Toxoplasmosis which was revealed by histo-pathology results. It was known that cats weren't the cause as vegetation has always been very carefully sourced. It was suspected that the animals may have been affected by one particular batch of mince meat. Dr Russell Hobbs, Parasitologist from Murdoch University, advised that lamb mince was the more likely source. Kanyana has only ever bought human-consumption quality beef mince but on questioning the butcher it was discovered that beef mince can contain other types of meat. Mince is used as a transporter for Insectivore, multivitamins and calcium. On Russell's advice all meat is now frozen for a minimum of three days, usually a week. **Any meat which is used for wildlife needs to be frozen for a minimum of three days, preferably a week, to kill off the Toxoplasma organism.**

In April 1999 one animal was discovered to have a tumorous wart in its pouch. This wart became cancerous and the animal subsequently died. The pathology report on this animal reported that it was an allergy. Subsequently more and more warts were found. When CALM was asked to check its breeding colony on the Peron Peninsula the warts were also found in their animals. Subsequent checks on museum specimens revealed that specimens gathered in the 1980s were also infected with the wart-like syndrome which was hitherto unrecognised.

In 2002, our breeding program was suspended and has now become a research project with infected animals from other areas being sent to Kanyana. The research program is being run by Dr Mandy O'Hara, Pathologist from Murdoch University, with help from two post-graduate vets from Murdoch University's *Masters in Conservation Medicine* course.

The wart-like syndrome was introduced to our breeding colony by animals from Bernier Island. Only the colonies of animals on Dorre Island and at the CSIRO facility at Heirisson Prong are apparently free of the warts, now thought to be a papilloma virus at this stage of the investigation.

Kanyana currently has 7 animals, 6 of whom are infected.

In April this year a Recovery Team was set up for the Banded Hare Wallaby, Burrowing Bettong and Western Barred Bandicoot. A recovery plan for these three species is being compiled by Dr Jacqui Richards who has, for many years, worked with Western Barred Bandicoots in the CSIRO's colony at Heirisson Prong.

This year two graduate vets have chosen to work on Kanyana's Western Barred Bandicoot research project as part of their Masters in Conservation Medicine with Murdoch University. These vets recently visited Dorre and Bernier Islands to determine population numbers and to ascertain the prevalence of a wart-like virus. Three nights of trapping on each island resulted in 13 Western Barred Bandicoots being caught on Dorre Island. None of these animals had the warts. Unfortunately, during the three nights of trapping on Bernier Island no Western Barred Bandicoots were caught. This begs the question, is it because the population numbers are low, or is the number of other animals on the island dominating the trapping results? Either way, the plight of the Western Barred Bandicoot is now critical. The sooner this species is made more secure by the relocation of the reintroduced animals from Heirisson Prong to Faure Island, the better. Western Barred bandicoots are due to be translocated to Faure Island later this year to add to a variety of reintroduced native mammals already resident on the island. Faure Island was acquired by the Australian Wildlife Conservancy in 1999.

Health & Veterinary Care

During the breeding program animals were weighed fortnightly with pouch checks carried out on all females.

Currently, animals are physically examined and weighed each month.

Apart from the wart-like syndrome these animals are free from other health problems.

Kanyana received a batch of 4-5 animals infected with Chlamydia eye infections which were successfully treated thanks to Dr Kris Warren from Murdoch University's School of Veterinary and Biomedical Sciences

A discovery has been that even in the pouch, siblings attack one another - biting off pieces of ear and tails and it is unusual to see a Western Barred with a complete tail or ear(s). The females become very aggressive towards the newly emerged pouched young and unless they are immediately separated they will go on to kill them. The females, being larger than the males, can also be quite aggressive to males and juveniles, if they are housed in the same enclosure for too long.

Observational monitoring at night is crucial for the successful breeding and management of any nocturnal Endangered Species. Each animal must be sighted at least once every 24 hours.

Since the outbreak of the wart-like syndrome our Western Barred enclosures are under quarantine with access allowed by only one person who is required to wear booties on entering the enclosure. Infected animals were isolated in different blocks of enclosures designated *infected* and *not-infected*. Hinged, external feed trays were installed to allow feeding without entry to the enclosures

BILBIES

Our captive breeding program for Bilbies is part of the national program controlled by the Bilby Recovery Team and involving Queensland, South Australia and Western Australia. Kanyana has exchanged animals with Desert Park in Alice Springs, Yookamurra Sanctuary and Monarto Zoo in South Australia and Peron Peninsula in WA.

Pairings are controlled by Dr Caroline Lees from the Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA).

Kanyana's is fortunate to have Lesley Polomka as our Bilby Co-ordinator. Lesley oversees the operation of our Bilby colony, monitoring their diet, general health and providing regular reports and recommendations on the program. Lesley is responsible for introducing computer-generated weight gain/loss reports & graphs as well as auto-calculating food consumption charts both of which are invaluable for accurate health monitoring.

Diet

Like the Western Barreds, Bilbies are omnivores.

Bilbies have a small caecum, suggesting that they require a high protein content in their food. Insects and their larvae are a source of protein to Bilbies in the wild where they also eat seeds, bulbs, fruit and fungi. Although in the wild they can go long periods without water, water is provided in drippers indicating that they consume 50mls per night probably because of the dry food content (Omnivore pellets) in their diet.

The availability of vegetation and food is one factor that determines the breeding season of the Bilby. A lactating female must have sufficient food available to feed herself and her young.

The captive diet consists of a variety of fruit and vegetables including apple, avocado, banana, beetroot, carrot, corn, melon, pear, potato, pumpkin and sweet potato. Cucumber, broccoli, lettuce and spinach provide greens. Live foods such as mealworms or crickets are also supplied daily. Cheese and scrambled egg are each fed, alternately, three times a week. Meatballs are fed daily to provide the high protein requirement. The meatballs are made from human-consumption mince that has been frozen for at least a week to prevent toxoplasmosis. The mince is mixed with vitamins, insectivore mix and calcium.

Marsupial omnivore pellets mixed with aviary seed are available at all times in one of the metal hoppers in each enclosure. Omnivore pellets are the only source of artificial food provided at the Dryandra release site.

All food is weighed-in and weighed-out with consumption figures recorded each day as this is a vital monitoring tool to quickly alert us to problems; the first sign of problems or sickness is a drop in food consumption. See attached food charts and weight graphs.

Breeding

Breeding checks are carried out on all of the Bilbies once a fortnight. During these checks, their weight and general body condition is monitored. Females are pouch checked with pouch activity graded to monitor breeding status and pouched young development.

Twins are common and captive animals can breed up to three times in a twelve month period. The gestation period is 14 days.

Kanyana has bred 74 animals and currently has 10 animals including 3 breeding pairs. Numbers are greatly reduced because most of our animals were transferred to Dryandra last Spring in readiness for the release of 40 animals from there last Christmas. For the first time in 60 years there are Bilbies in the wild in the south west of WA.

All our Bilbies, following our State's example of using aboriginal names for native species, are given aboriginal names.

The *Lows*, and the *Highs*

Dental problems are an ongoing worry. Scale build-up on teeth leads to abscessed teeth and can lead to Lumpy Jaw which has caused severe ill health and death in 5 Bilbies. The scale build-up is thought to be due to their captive diet which is much softer than a wild diet where they would be chewing roots and branches. Regular scaling of the teeth keeps the problem in check. This is carried out, under anaesthetic, by our vet Dr Tim Oldfield of Wattle Grove Veterinary Hospital. One of our resourceful volunteers came up with the idea of a *toothbrush* which is a short length of bamboo filled with peanut paste. The Bilbies love peanut paste and are forced to chew the bamboo to get at the peanut paste inside.

Another *low* was our first release of Bilbies into the wild at Dryandra. Six animals were released in Autumn prior to the sudden onset of a very severe Winter. Food supplies dropped off and the animals died after about six weeks.

Other *lows* are the deaths of old animals which have been in the breeding program for 6-7 years.

The *highs* which cause great elation are the discovery of pouched young and their subsequent emergence from the pouch when the *lows* are all but forgotten. Another *high* is the knowledge that for the first time on 60 years there are Bilbies in the wild in the south west of WA, and that Kanyana has contributed to the survival of the species.

Husbandry

Kanyana's housing is designed to take into account the wide range of Perth weather conditions. In Summer temperatures can, periodically, range between 30-40c for six months of the year. Winter temperatures can drop to 5c at night. Wooden nesting boxes contain shredded office paper and sit on a thick base of clay bricks. 15cm diameter thick industrial poly pipe forms a 6.5 metre U shaped *tunnel* from the nesting box, around the perimeter of the enclosure, opening into the sand. The poly pipes are

covered with 20cm of coarse washed river-sand cover to maintain a constant temperature. In extreme heat the use of water misters and fans is necessary. To prevent fungal or bacterial growth in the sand, the use of misters is carefully controlled so that the sand doesn't become too wet allowing it to be quickly dried by the fan through evaporation which also results in maximum cooling.

The enclosures are equipped with red lights to allow night time viewing and monitoring of the Bilbies. Food is contained in vermin-proof metal containers with flip-top lids.

Water is provided in lick-drip bottles. The sand in the enclosures is sieved every day to remove faeces and any food remnants. The sand is replaced every 12 months. The sides and base of the enclosures are made of ½ inch square wire to prevent mice getting into the enclosures.

The Bilby enclosures were converted from enclosures which were built and subsequently donated by overseas film companies after the completion of their filming projects *Deadly Protectors* (Anglia Survival) and *Life-cycle of the Red-tailed Phascogales* (BBC).

Health & Veterinary Care

Bilbies have long toenails and occasionally tear claws while digging next to the wire mesh.

Minor mating wounds on females are common; occasionally they receive more severe wounds. A female recently had her ear badly lacerated which prior to the advent of the variety of new-generation dressings now available would have required suturing.

Recently one male has, after his last two matings, had bleeding abrasion wounds on his back legs. These wounds were treated with new-generation dressings such as Solosite gel, Melanin and Duoderm with their near miraculous healing abilities. The 18 hour mating marathons come at a cost !

Kanyana has had one episode in which *Cryptosporidium muris* was detected in the faeces of bilbies from certain enclosures. The infection was treated successfully with high doses of Dimetridazole (Emtryl). Although the enclosures are vermin-proof, mice do find occasionally find their way into the enclosures. Flip-top metal hoppers were introduced to prevent food contamination by vermin.

Kanyana does its own faecal testing of the Bilbies every six weeks and, to date, have never found any parasites or harmful bacteria in any of the samples collected except for the one episode of *Cryptosporidium muris*.

Thanks to Dr Kris Warren's blood sampling of our Bilbies, normal values for Bilby blood are now available and used Australia-wide.

Bilbies may live for up to 6 to 7 years in captivity, however 5 years is more usual. Life expectancy in the wild is unknown. Kanyana currently has two elderly males who at 6 years old require geriatric care which has, for one of the animals, involved the removal of the pipes (tunnels) from his enclosure, finely chopping his food, heating his sleeping box and providing extra padding in the box.

The Way of the Future

All breeding programs need a vet, preferably trained in wildlife conservation, as part of the team. It is essential to determine normal blood values for all our endangered species.

In hindsight, it is becoming apparent that many of the world's endangered species will never be released back to their original habitats. Most will need protection either from fencing or isolation on islands to survive.

More national community-based programs should be encouraged as there is more funding available for community-based programs.

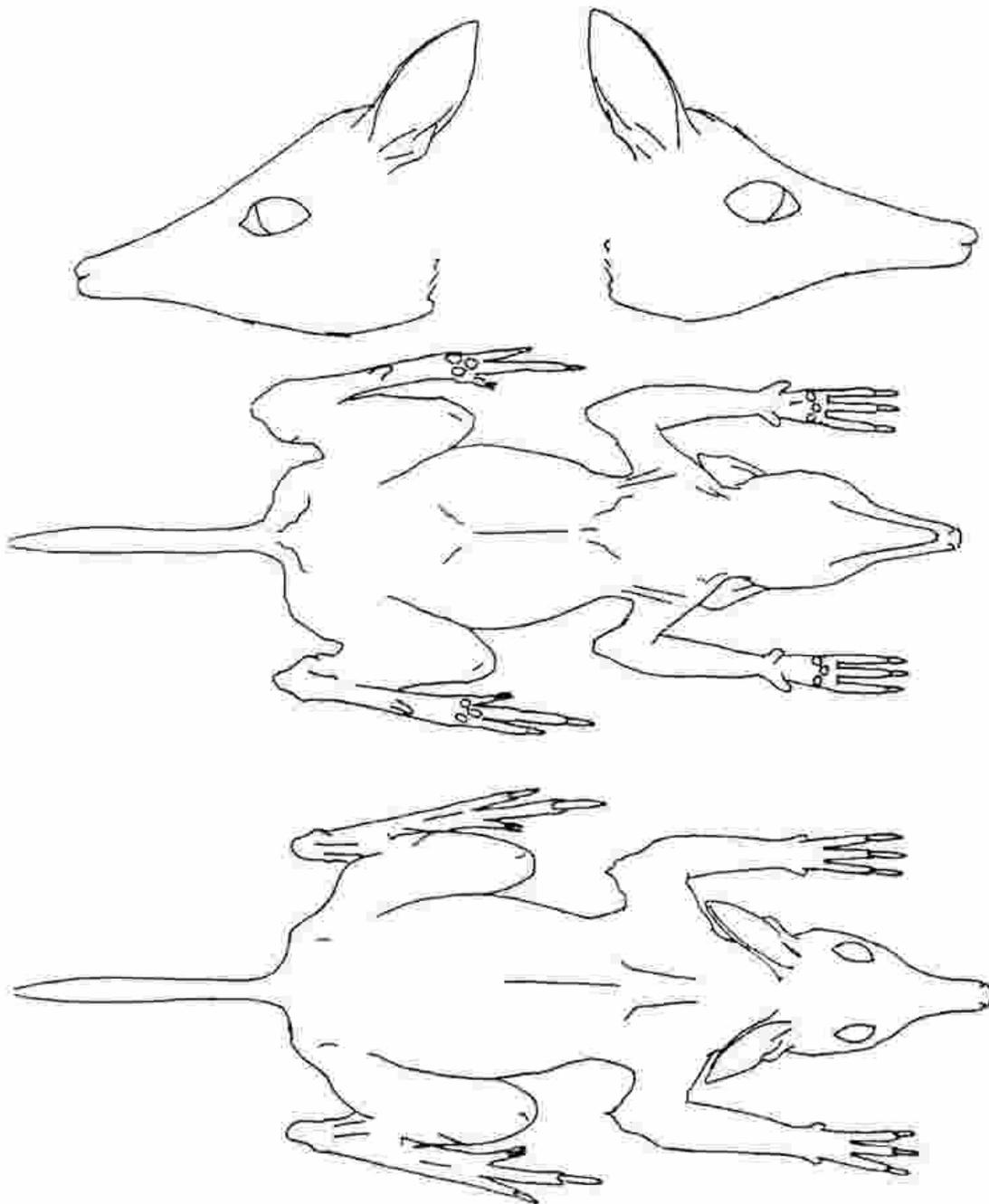
A real priority for government should be the establishment of suitable habitat for release sites such as the recent acquisition, by the WA government, of Dirk Hartog Island.



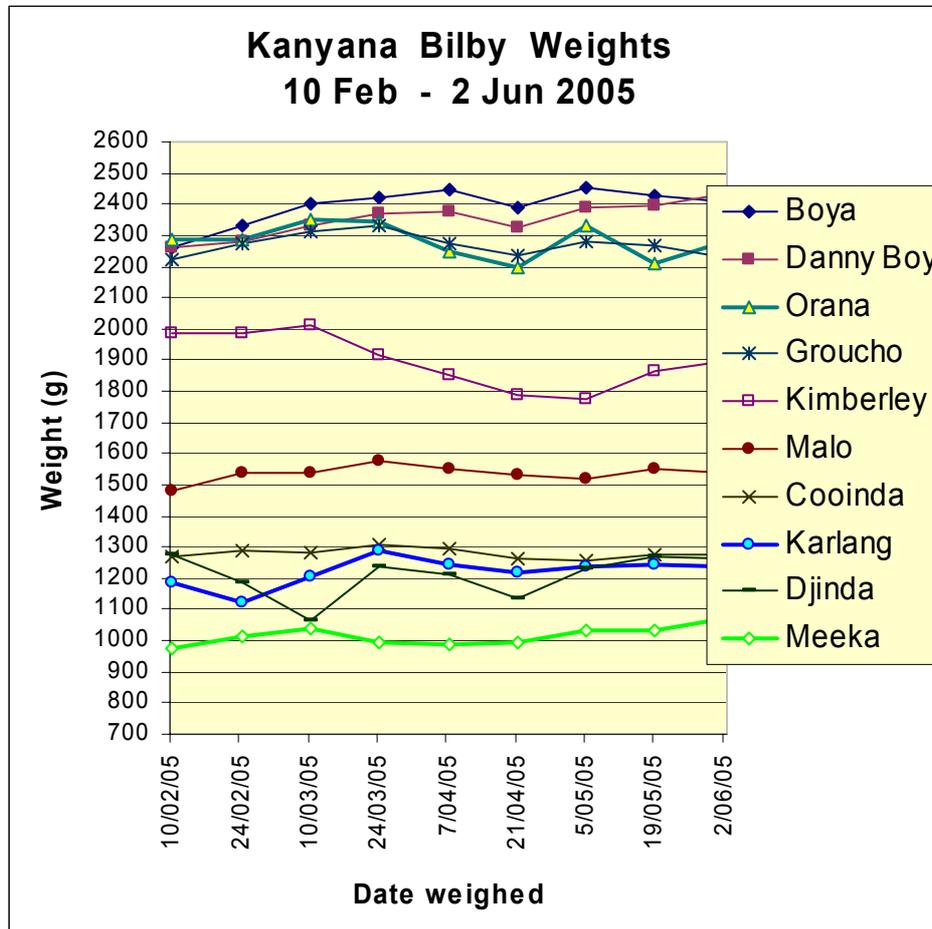
Western Barred Bandicoot Lesion Recording Chart

Date _____ Enclosure _____ Microchip Number _____

Sex M / F



BILBY NAME	Weight (g)								
	10/02/2005	24/02/2005	10/03/2005	24/03/2005	7/04/2005	21/04/2005	5/05/2005	19/05/2005	2/06/2005
1 Boya	2264	2330	2400	2422	2444	2392	2454	2428	2406
3 Danny Boy	2258	2282	2334	2370	2378	2322	2388	2396	2434
# Orana	2286	2286	2350	2342	2246	2196	2332	2212	2278
5 Groucho	2224	2276	2310	2330	2274	2234	2280	2268	2228
7 Kimberley	1986	1986	2012	1916	1850	1786	1776	1864	1898
8 Malo	1478	1540	1538	1574	1554	1530	1520	1552	1536
2 Cooinda	1268	1290	1280	1306	1294	1262	1258	1278	1276
6 Karlang	1188	1122	1206	1288	1246	1216	1236	1244	1238
4 Djinda	1276	1188	1064	1236	1210	1134	1234	1272	1264
9 Meeka	978	1012	1036	994	990	994	1034	1032	1070



Kanyana Bilby Food Chart Enclosure 7 - 10 plus Quarantine

	FOOD GIVEN, GRAMS (PM)			FOOD REMAINING, GRAMS (AM)			BAMBOO		Number of				
	excluding weight of dish			excluding weight of dish			Chewed ?		Bilbies sighted ?				
, afternoon		, Morning			(AM)		(AM)				
	Date in	Veg	Pellets	Date out	Veg	Pellets	Yes	No	0	1	2	3	4
Enclosure 7	8/08/2005		2250g	9/08/2005									
	9/08/2005		2250g	10/08/2005									
	10/08/2005		2250g	11/08/2005									
	11/08/2005		2250g	12/08/2005									
	12/08/2005		2250g	13/08/2005									
	13/08/2005		2250g	14/08/2005									
	14/08/2005		2250g	15/08/2005									
Enclosure 8	8/08/2005		2250g	9/08/2005									
	9/08/2005		2250g	10/08/2005									
	10/08/2005		2250g	11/08/2005									
	11/08/2005		2250g	12/08/2005									
	12/08/2005		2250g	13/08/2005									
	13/08/2005		2250g	14/08/2005									
	14/08/2005		2250g	15/08/2005									
Enclosure 9	9/08/2005		2250g	9/08/2005									
	10/08/2005		2250g	10/08/2005									
	11/08/2005		2250g	11/08/2005									
	12/08/2005		2250g	12/08/2005									
	13/08/2005		2250g	13/08/2005									
	14/08/2005		2250g	14/08/2005									
Enclosure 10	8/08/2005		2250g	9/08/2005									
	9/08/2005		2250g	10/08/2005									
	10/08/2005		2250g	11/08/2005									
	11/08/2005		2250g	12/08/2005									
	12/08/2005		2250g	13/08/2005									
	13/08/2005		2250g	14/08/2005									
	14/08/2005		2250g	15/08/2005									
Quarantine	8/08/2005		2250g	9/08/2005									
	9/08/2005		2250g	10/08/2005									
	10/08/2005		2250g	11/08/2005									
	11/08/2005		2250g	12/08/2005									
	12/08/2005		2250g	13/08/2005									
	13/08/2005		2250g	14/08/2005									

NB: After weighing pellets/seed in mornings, top up container to 2250g.

COMMENTS:

Western Barred Bandicoot Food Chart - Encl 4-9

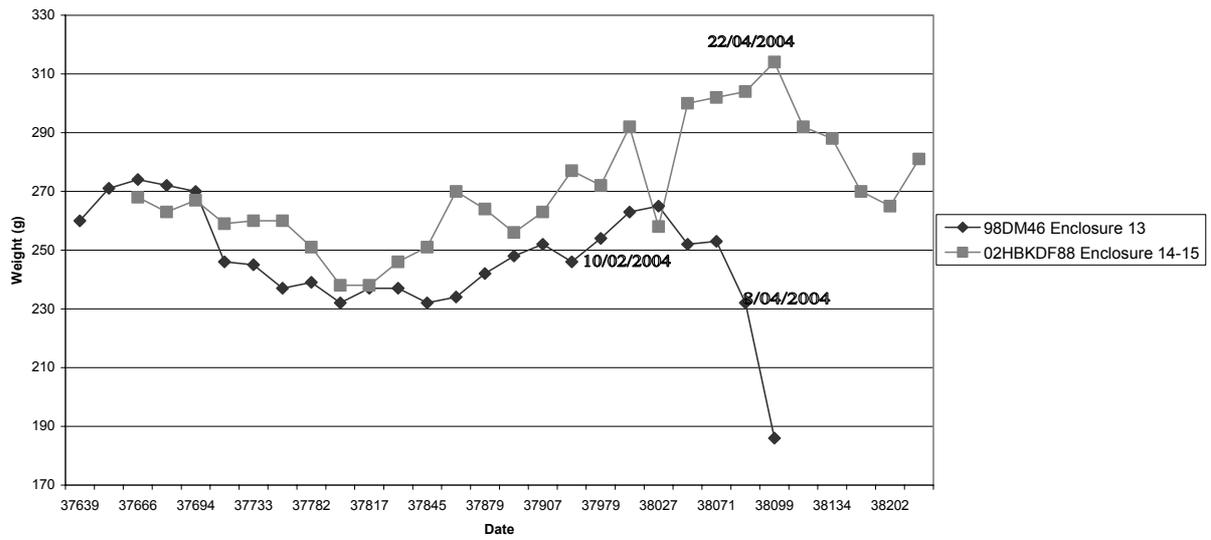
See food chart for diet and quantities of fruit, vegetables, seed and protein

		FOOD GIVEN (PM)			FOOD REMAINING (AM)	FOOD EATEN		BODYWEIGHT	
		excluding weight of dish				excluding weight of dish		Weight eaten	Fortnightly bodyweight
		Afternoon				Morning		Grams	Grams
		Date in	Grams	Protein		Date out	Grams	Grams	Grams
Enclosure 4	No Microchip	15/08/2005	205	M E C		16/08/2005			
		16/08/2005	205	M E C		17/08/2005			
		17/08/2005	205	M E C		18/08/2005			
		18/08/2005	205	M E C		19/08/2005			
		19/08/2005	205	M E C		20/08/2005			
		20/08/2005	205	M E C		21/08/2005			
		21/08/2005	205	M E C		22/08/2005			
Enclosure 5	M'chip 000 5FC 8FEC	15/08/2005	205	M E C		16/08/2005			
		16/08/2005	205	M E C		17/08/2005			
		17/08/2005	205	M E C		18/08/2005			
		18/08/2005	205	M E C		19/08/2005			
		19/08/2005	205	M E C		20/08/2005			
		20/08/2005	205	M E C		21/08/2005			
		21/08/2005	205	M E C		22/08/2005			
Enclosure 6	M'chip 0673 7E00	15/08/2005	205	M E C		16/08/2005			
		16/08/2005	205	M E C		17/08/2005			
		17/08/2005	205	M E C		18/08/2005			
		18/08/2005	205	M E C		19/08/2005			
		19/08/2005	205	M E C		20/08/2005			
		20/08/2005	205	M E C		21/08/2005			
		21/08/2005	205	M E C		22/08/2005			
Enclosure 7	M'chip 0006 6E8 136	15/08/2005	205	M E C		16/08/2005			
		16/08/2005	205	M E C		17/08/2005			
		17/08/2005	205	M E C		18/08/2005			
		18/08/2005	205	M E C		19/08/2005			
		19/08/2005	205	M E C		20/08/2005			
		20/08/2005	205	M E C		21/08/2005			
		21/08/2005	205	M E C		22/08/2005			
Enclosure 9	M'chip 000 604 2ABC	15/08/2005	205	M E C		16/08/2005			
		16/08/2005	205	M E C		17/08/2005			
		17/08/2005	205	M E C		18/08/2005			
		18/08/2005	205	M E C		19/08/2005			
		19/08/2005	205	M E C		20/08/2005			
		20/08/2005	205	M E C		21/08/2005			
		21/08/2005	205	M E C		22/08/2005			

NB: Protein - please circle which given M = meatballs or E = egg or C = cheese

COMMENTS: Please include date, time, relevant enclosure number and your name so that we can follow up with you if necessary

Kanyana - Western Barred Bandicoot Weight Records



KANYANA - BILBY WEIGHTS

BILBY NAME	Sex	Date of Birth	DATE WEIGHED:		5/05/2005		19/05/2005			2/06/2005			Total gain or loss this period (g)	Total % change this period
			Summary for previous period 8/4/05 - 5/5/05		Enc. No.	* Initial Weight (g)	Enc. No.	Weight (g)	% Change	Enc. No.	Weight (g)	% Change		
			Total Change (g)	Total % Change										
1 Danny Boy	M	Feb-02	10	0.5	1	2388	1	2396	0.3	1	2434	1.6	46	1.9
2 Kimberley	F	Feb-02 ? (<2002)	-74	-4.0	1	1776	1	1864	5.0	1	1898	1.8	122	6.8
3 Boya	M	14-Feb-03	10	0.5	2	2454	2	2428	-1.1	2	2406	-0.9	-48	-2.0
4 Djinda	F	Feb-03 ? (<2003)	24	2.5	3	1234	2	1272	3.1	3	1264	-0.6	30	2.5
5 Meeka	F	05-Sep-04	44	4.4	3	1034	3	1032	-0.2	3	1070	3.7	36	3.5
6 Malo	F	07-Jan-03	-34	-2.2	4 & 5	1520	4 & 5	1552	2.1	4 & 5	1536	-1.0	16	1.1
7 Cooinda	F	02-Oct-03	-36	-2.8	4 & 5	1258	4 & 5	1278	1.6	4 & 5	1276	-0.2	18	1.4
8 Orana	M	Nov-99	86	4.0	7	2332	7	2212	-5.1	7	2278	3.0	-54	-2.2
9 Groucho	M	29-Jul-99	6	0.3	9 & 10	2280	9 & 10	2268	-0.5	9 & 10	2228	-1.8	-52	-2.3
10 Karlang	F	Feb-03 ? (<2003)	-10	-0.8	9 & 10	1236	9 & 10	1244	0.6	9 & 10	1238	-0.5	2	0.2

KEY: **Bold type** indicates a minor weight loss.

Bold type figure inside a dark shaded box indicates a substantial weight loss (more than 5%).

Italic figure inside a light shaded box indicates a substantial weight gain (more than 5%).

* "Initial Weight" is the last weight recorded in the previous reporting period.

COMMENTS:

2. **Kimberley** lost weight in the two previous reporting periods, following her pairing with Danny Boy on 10/3. During the current reporting period she has regained a substantial amount of weight, however her weight is still slightly lower than before she was paired with Danny Boy (refer to attached graph of Bilby Weights for the last 3 months). She appears healthy and will hopefully continue to gain weight in the next reporting period.

8. **Orana** recorded a substantial weightloss on 19/5, possibly due to his mystery ear problem, but gained weight again in the following fortnight.