GILBERT'S POTOROO RECOVERY TEAM

ANNUAL REPORT

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by Tony Friend and Tania Butler

for

The Gilbert's Potoroo Recovery Team

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Helping Communities Helping Australia

Department of Conservation and Land Management

SUMMARY

Gilbert's Potoroo is the most endangered mammal in Australia. The tiny single population is restricted to the slopes of Mount Gardner, at Two Peoples Bay. Searches for colonies in Two Peoples Bay Nature Reserve have resulted in the location of only three separate areas where potoroos can be caught regularly, and the number of wild individuals captured during 1999 was only 16.

A captive colony was established in December 1994 when the species was rediscovered. Eight animals (five adults, a juvenile and two pouch young) comprised the founder group. Five years later, the colony numbers only 11 individuals, despite rising to a maximum of 14, and breeding has been erratic.

During 1999, however, several significant advances in knowledge that will enhance the conservation effort have been made. A new breeding manipulation has been tried successfully, utilising a group of four females with one male. Breeding occurred within weeks, although none of the same animals had bred in the previous two years while housed in pairs. On the basis of this success, the captive facility is being extended to allow more flexibility of accommodation. Research into methods of detecting oestrus in Gilbert's Potoroo is being carried out through collaboration between CALM and the University of WA. Three potoroo deaths over two years have been attributed to kidney failure due to deposition of oxalate crystals in the kidney. Research into the causes of this syndrome and possible reformulation of the captive diet is being carried out through collaboration between CALM, the resident potoroo veterinarian, Agriculture WA and CSIRO Animal Nutrition.

Radio-tracking has been utilised to learn more about the habitat use and social organisation of Gilbert's Potoroo. This will provide information vital to the design of captive breeding protocols and to assist in selection of survey sites on and off Two Peoples Bay NR and of potential translocation sites. In a pilot project, two males were tracked for several nights and home range maps constructed. New nesting information was also collected. A major tracking exercise will be carried out early in 2000, funded by a Landscope Visacard grant.

Genetic research has also been stepped up in 1999, with the successful application for funding from National Geographic Magazine. This has provided funds to support the laboratory work necessary to allow a pedigree analysis of the wild and captive populations.

Lack of funding is one of the greatest difficulties now facing the effort to save Gilbert's Potoroo. Environment Australia has cut its financial support to the recovery program from $81 100 in 1999/2000 to $40 000 in 2000/2001. Corporate funding sources are being approached in an attempt to keep the program running at its current level.

CONTENTS

After the discovery of a population of potoroos at Two Peoples Bay in December 1994, it was quickly proved that not only were they the same as those collected by John Gilbert from the south coast of WA in the 1860s, but also that they represented a potoroo species distinct from eastern Australian forms (Sinclair *et al.*, 1996, Sinclair and Westerman, 1997). Since then, a concerted effort has been made by CALM staff, volunteers and collaborating workers from other organisations to improve the conservation status of *Potorous gilbertii*.

During 1999, as in other years, the effort has been split between captive breeding, survey for additional colonies and populations, and learning about the biology and requirements of the species. The emphasis has always been on the production of more individuals in order to establish the additional populations required to remove the species from the brink of extinction.

These efforts were guided and coordinated initially through the Interim Wildlife Management Guidelines for Gilbert's Potoroo (Start and Burbidge, 1995) and later through the Gilbert's Potoroo Recovery Plan (Courtenay *et al.*, 1998). The Gilbert's Potoroo Recovery Team was formed in 1995 to oversee the writing of these plans and their implementation.

MEMBERSHIP

The membership of the Gilbert's Potoroo Recovery Team at the beginning of 1999 was as follows:

Alan Danks (Chair)	CALM South Coast Region
Andrew Burbidge	CALM, WATSCU
Jackie Courtenay	Wildlife biologist
Kevin Ellard	Wildlife Veterinary Services
Tony Friend	CALM/CALMScience
Bruce Male	Environment Australia, Threatened Species & Communities Section
Alan Needham	ECU Applied Science
Vic Smith	Representing local conservation groups

During the year, CALM was notified of a decision of the Threatened Species and Communities Section of Environment Australia that section staff would no longer be attending recovery team meetings on a regular basis. In addition, responsibilities were changed such that one staff member would be the contact person for all WA recovery programs. Early in the year, this person was Susanne Ward, but she was later replaced by Sarah May.

MEETINGS

The Recovery Team met once during 1999. Meeting 12 was held at the Two Peoples Bay Visitor Centre on 13 December.

RECOVERY PLAN STATUS AND FUNDING

The Gilbert's Potoroo Recovery Plan (Courtenay *et al.* 1998) replaced the Interim Wildlife Management Guidelines for Gilbert's Potoroo (Start and Burbidge 1995) and was submitted in March 1998 for funding under the Endangered Species Program. The Plan was funded by Environment Australia to the amount requested ($81,100) in 1999/2000. The Scope Items relating to Recovery Plan (RP) Actions were as follows:

1999.01. Appoint scientist and technical officer to implement RP – as per RP Action 4.1

1999.02. Develop and maintain breeding colony of at least 20 animals [see RP Action 4.2]

1999.03. Investigate and document the distribution and resource requirements of the Potoroo at Two Peoples Bay - as per RP Action 4.4.

1999.04. Continue a quantitative monitoring program to record changes in population density and area of occupancy of wild Potoroos as per RP Action 4.5

1999.05. Search for Potoroos outside Two Peoples Bay NR – as per RP Action 4.7

During 1999, the Team received notice that Environment Australia's contribution to the Gilbert's Potoroo Recovery Plan was to be cut by almost half the amount requested ie in response to an application for $77 200 as per the Recovery Plan, EA's contribution would be only $40 000.

IMPLEMENTATION OF RECOVERY PLAN ACTIONS

1. Appoint a scientist and a technical officer to implement the Recovery Plan

The Recovery Plan funding from Environment Australia provides salary for a Technical Officer to assist in carrying out some of the Actions in the plan. Supervision of the Recovery Plan implementation is the responsibility of CALMScience Division. During 1998, Tony Friend, a Principal Research Scientist with CALMScience with experience in conservation biology of threatened marsupials, was appointed as Project Leader, Gilbert's Potoroo Recovery Program, commencing in January 1999. Tania Butler had been appointed as the Technical Officer on the potoroo project in March 1998, with funding from EA (Gilbert's Potoroo Interim Recovery Plan Extension).

These staffing arrangements continued in 1999.

2. Develop and maintain a breeding colony of at least 30 potoroos plus surplus animals pending translocation.

Size of captive colony

The captive colony of Gilbert's Potoroo at Two Peoples Bay was established in 1994, immediately after the rediscovery of the species. Five adult (one male, four female) and one juvenile (male) animal were taken from the wild during the first six months after the rediscovery. At time of capture, two of the females had pouch young that were subsequently raised to independence. These eight animals were the founders of the breeding colony.

By the beginning of 1999, only six captive-bred young had been born in the colony. The size of the breeding colony stood at 12 individuals (5 males, 7 females). No young had been produced since December 1997, although a tiny dead young had been found in female #27's pouch on 4 December 1998 while she was paired with male #11.

Breeding success

In June 1999, a new strategy was tried, housing a number of females together with a male, rather than simply pairing them. One female (#27) was kept with a male (#11) for three weeks, then two more females (#18 and #32) were added. Although this situation lasted only two weeks, mating between male #11 and female #27 occurred during this time and aggression between the females became strong. Female #32 was removed for her own safety, then after another two weeks, female #27, who turned out to be pregnant, was moved out on 2 July because of aggression between her and the other female.

Female #27 was found with a pouch young on 5 August 1999. By the end of 1999, this young male, #46, weighed 280g.

We believe that components contributing to this breeding success were the element of choice for the male, competition between the females, and the separation of the female from other potoroos before the birth of the young. However, the current breeding facility is not large enough to allow both the establishment of larger groups and the separation of animals, with the current colony size. In addition, the demands of the oestrus monitoring program (see below) further complicate animal

housing. In order to provide enough flexibility in accommodation, the construction of six additional pens has been commenced (see below).

The history of pairing and other combinations involving females still alive during 1999 is shown in Table 1.

Table 1. Attempted breeding combinations in Gilbert's Potoroo captive breeding colony, showing all pairings established (some combinations involved more than two animals).

Female	Preferred males ("unrelated")	Pairings Attempted		
		Male #	Dates	Outcome
#1	#3, #6, #7, #11, #28	6	6/11/97 – 23/2/98 29/9/99 – 27/10/99	No py
		11	23/2/98 – 13/5/98 **22/12/99 - present**	No py
		28	**13/5/98 – 18/8/99**	No py
		7	**27/10/99 – 13/11/99**	No py
		3	**13/11/99 – 22/12/99**	No py
#10	#3, #6, #7	3	6/11/97 – 14/1/98 13/5/98 – 12/8/98 **4/9/98 – 27/10/99** **28/12/99 - present**	**Py - #36** No py
		6	**27/10/99 – 28/12/99**	No py
#18	#3, #7, #11, #28	11	6/11/97 – 13/5/98	No py
		6	**13/5/98 – 9/6/99**	No py
		11	**9/6/99 – 27/10/99** **22/12/99 – 28/12/99**	No py
		7	**27/10/99 – 13/11/99**	No py
		28	**13/11/99 – 22/12/99** **28/12/99 - present**	No py
#19 (Died 24/11/99)	#6, #7	7	6/11/97 – 13/5/98 **8/12/98 – 14/4/99**	No py
		11	13/5/98 – 23/7/98 **29/9/99 – 6/10/99** **27/10/99 – 10/11/99**	No py.
		36 (Juvenile)	4/9/98 – 8/12/98	No py
		6	**9/6/99 – 18/8/99**	No py

Table 1 (cont/d)

#27	#3, #6, #7, #11, #28	7 11	6/11/98 – 13/5/98 **13/5/98 – 2/7/99**	No py Dead py in pouch on 4/12/98. **Py found in pouch 5/8/99.** **Pouch exited December 99**
#32	#6, #7	3 7 11	6/11/97 – 14/1/98 **13/5/98 – 26/5/99** **26/5/99 – 9/6/99** **29/6/99 – 22/12/99** **28/12/99 - present** **9/6/99 – 29/6/99** **22/12/99 – 28/12/99**	No py No py No py

Two animals (females #4 and #19) died during the year. Female #4 was very old and had experienced a variety of health problems for over a year. Female #19 was the third case of kidney failure due to deposition of oxalate crystals (see Health Issues below and the Appendix for details). At the end of 1999, the colony's numbers stood at 11 (6 males, 5 females).

Oestrus study

The oestrus study initiated by Kevin Ellard and Jackie Courtenay and funded by WWFA continued in 1999. The study employs assays of faecal oestradiol to detect oestrus, as a less invasive method of tracing the oestrus cycle than taking frequent blood samples. Scats are collected from a mat placed under the animal's feeding bowl. If a female is housed with a male, the pair must be separated before the collection period to ensure that the correct faecal pellets are collected. Samples are collected at 3-day intervals over 30-day periods.

Hormone assays are run by Ernie Stead-Richardson, a Ph. D. student in the Zoology Dept, University of WA. Up to the end of 1999, collection of faecal samples has been carried over three periods, commencing in November 1998, April 1999 and August 1999. Preliminary results from the 1998 samples indicate that at least some of the females are cycling (Wildlife Veterinary Services 1999).

Faecal samples are also being collected opportunistically from wild females when they are trapped during the field program.

Reproductive research on Gilbert's potoroo at Two Peoples Bay takes full advantage of the unique situation, with a breeding colony in close proximity to a wild population and a high level of support for the project in terms of personnel, facilities and funding. The convenience of access of the highly qualified, locally-based project team to both captive and wild individuals and the ability to draw on world-class expertise in Perth for support such as faecal hormone analysis present a rare opportunity to advance our knowledge of reproductive biology of the species in order to establish intensive captive management protocols that improve reproductive success.

Health issues

The demise of female #19 in November 1999 from kidney failure due to the deposition of oxalate crystals in the kidneys was the third death in the captive colony due to this cause (see Appendix). Since the deaths of female #17 and male #32, an investigation of possible origins of dietary oxalate

has been carried out, without identification of any suspect food or other ingestible source. Other causes for the deposition of oxalate are being followed up, including a possible dietary imbalance of vitamin B6, calcium, pH of the intestinal tract and a genetic disorder previously recorded in humans. Blood samples are being taken from wild and captive animals to establish normal values and Dr Colin White, a nutritionist with CSIRO, has been enlisted to work with the team in identifying possible dietary inadequacies.

Extension of captive breeding facility

As explained above, the extension of the breeding facility has become an urgent necessity to provide the flexibility of accommodation required for breeding manipulation and the oestrus investigation. Plans drawn up during 1998 were modified slightly and by the end of 1999 prefabricated wall sections were being made up off-site. Six additional pens will be added to the existing building so that the whole facility will comprise two banks of seven cages with a central corridor between them. The pens will be completed early in 2000.

3. Write and implement a Working Plan to oversee hygiene, husbandry and genetic integrity of the captive colony.

The Captive Management Plan for Gilbert's Potoroo (Courtenay 1998) was written as a draft by Jackie Courtenay before her departure from the project. This document has been used as a working draft, but has not been substantially modified since its completion. It will continue to be used in the operation of the breeding colony until there is a clear need to update it.

4. Investigate and document the distribution and resource requirements of Gilbert's Potoroo at Two Peoples Bay NR.

Survey trapping

In addition to regular trapping on traplines in potoroo habitat, several temporary traplines were established in order to monitor sites where potoroos had previously been recorded. These were placed at Hakea and Robinsons Gullies, on the western side of the Mt Gardner peninsula. Hakea Gully trapline was the site where Liz Sinclair trapped the first potoroos and where four of the breeding colony founder animals were trapped. Few animals have been caught there since and trapping in early 1998 produced no captures. No trapping has been conducted at Robinsons Gully for several years.

Results of trapping are shown in Table 2. A small colony (2 males, one female and one juvenile female captured) has now become established at Hakea Gully. These were all new animals. At Robinsons, a male first captured as a young at heel in February 1999 at East Firebreak trapline, about 1.5 km away, was captured on 7 December 1999, now as an adult.

Table 2. Results of trapping for potoroos at six sites at Two Peoples Bay

Site	Date	Trap Nights	Potoroo #	Other Species trapped
East Fire Break	9/1/99 – 15/12/99	337	21 adult males captures (3 individuals); 7 juvenile male captures (2 individuals) and 12 adult female captures (2 individuals); 2 new large pouch young, both implanted	Quenda, bush rat, quokka, bobtail
Lower Fire Break	5/1/99 – 20/1/99	511	No potoroos	Bush rat, *Mus*, quenda, quokka, dunnart, mardo, *Varanus*
North Firebreak	19/1/99 – 18/2/99 5/10/99	240	8 adult male captures (2 individuals – 1 from EFB, 1 from My Gardner road survey); 1 adult female capture (from EFB)	Quokka, quenda, bush rat, mardo, *E. napoliensis*, *E. kingii*
Hakea	25/5/99, 21/12/99	149	5 adult female captures (1 new adult female with large pouch young); 6 adult male captures (2 new adult males); 2 juvenile captures (1 individual)	Quokka, bush rat, quenda
Robinsons	22/6/99 7/12 – 8/12/99	34	1 adult male, first caught at East Fire Break	Mardo, bush rat
West 6	30/7/99 – 28/10/99	80	2 adult male captures (2 individuals); 2 adult female captures (1 individual)	Bush rat, *E. kingii*, quenda

Hair-arching

Collection of mammal hairs as a means of survey for potoroos was carried out at only one site at Two Peoples Bay in 1999. Forty hair tubes were placed at a site above the road to Little Beach that appeared to contain suitable habitat. No potoroo hairs were retrieved.

Radio-tracking

Funds were received through a Landscope Visacard Conservation Grant to carry out a radio-tracking study of potoroos at Two Peoples Bay. A pilot study was carried out on 6-9 April 1999. Two male potoroos were caught on the East Firebreak trapline and fitted with radio collars. The animals were tracked from three tracking stations where a dual Yagi null-peak antenna system was mounted on a 3-4 m mast. Over 70 fixes were gained from each of the two animals over four nights, sufficient to define their home ranges and determine the degree of overlap between individuals.

After the radio-tracking period, one radio-collared animal was fitted with a spool line and released at 0400, so that the line would not have all been paid out by morning and it could be followed to the animal's nest. When the animal was approached, it moved off and the thread was followed to the spot where the signal had been located. No obvious nest was found. When the other radio-collared animal was tracked to its rest site, however, it did not move until the observer was within site of the nest. Two adult potoroos and a juvenile were seen leaving the nest site. They were assumed to be the male, a female and her young at heel. The only known female living in that area with a young at heel was female #25. The nest itself was simply a space underneath the overhang of two sedge clumps containing no nest material but quite flattened where the animal had been sitting.

Documentation of diet in the wild

Bougher (1998) examined 10 scats collected from wild potoroos during 1994 and 1998 and found that over 90% of the scat content comprised fungal material. Very little remained in the scats apart from spores. Syme (1999) identified a number of hypogeal fungi occurring at Two Peoples Bay, but also found the spores of significantly more species in scats collected in every month of the year than were found in the field by experienced fungi experts. An honours project in 2000 will examine scats collected from wild potoroos in order to further define the diet.

Nutritional analysis of fungi

The analysis of fungi found in the diet of the potoroo was recommended in the Recovery Plan. During 2000, a program to collect and carry out nutritional analyses of the fruiting bodies of hypogeal fungi will be carried out. This process will put us in a better position to design an artificial diet that will allow healthy maintenance and breeding in captivity.

Pedigree analysis of wild and captive populations

Although no actions listed in the recovery plan (Courtenay *et al.*, 1998) include any investigation of the genetic status of the *P. gilbertii* population, we believe that an understanding of the familial relationships between individuals is an essential prerequisite for the best management of both the wild and captive groups. To this end, an application was submitted to National Geographic Magazine for a scientific research grant, which would fund the microsatellite DNA analysis necessary to determine relationships between individuals. The applicants for the grant were Liz Sinclair (Brigham Young University, Provo, Utah), Tony Friend (CALM) and Keith Cranshaw (BYU). The application was successful and the amount of US$6500 was granted to BYU and CALM for work to be completed in 2000. Tissue samples have been collected from those animals for which Liz Sinclair does not have samples or DNA remaining from her previous work on the species.

5. *Establish a quantitative monitoring program to record changes in population density and area of occupancy of wild potoroo populations.*

Mt Gardner Road Survey

In order to establish a regular and easily repeatable trapping protocol conforming with Western Shield monitoring procedures, a transect of 67 cage traps and Elliott traps was set up in 1996 at permanently marked sites at 100m intervals along the Mt Gardner management track in 2PBNR. Trapping is carried out for three nights in spring each year. During the October 1998 survey, one male potoroo (male #37) was caught, in an area on Tick Flat where no evidence of potoroos had been detected before, but near where Sarah Vetten had carried out an intensive hair-arch survey for potoroos in 1997, without success. This animal was later (during 1999) recaptured regularly in the North Firebreak area about 1.5 km away, so it appears to have been trapped while moving outside its usual home range.

Another potoroo was captured during the 1999 survey, which was extended to four nights, in keeping with the protocol used in Western Shield monitoring. This known animal, female #25, was trapped at the closest point on the road to her usual capture site on the East Firebreak trapline, and

presumably within her home range. A large male pouch young was in the trap with her and was implanted with a PIT chip for identification (male #45).

Other regular trapping

Trapping was carried out in six sites during 1998, for several purposes:

a) To monitor potoroo health and abundance at known colony sites
b) To collect scats for dietary and hormone analysis
c) To collect information on dispersal of young.

Areas trapped on a regular basis were East Firebreak and West Six gully. Hakea Gully was trapped once in order to determine whether potoroos had moved back into the area in the previous year. The results of the trapping are shown in Table 2.

Abundance

Numbers of known animals are as follows:	East/North Firebreak –	8
	Hakea gully	4
	West Six	3
	Robinsons	1

The number of animals known is only a proportion of the total population at Two Peoples Bay. Nevertheless, the indication is that the population is very small.

Health

Wild potoroos were given the same health checks as those in the captive colony. There has been no evidence of kidney failure in the wild but this is being investigated.

6. *Abate processes that may threaten or limit area of occupancy and/or population density of potoroos.*

Predation by cats and foxes

Due to the importance of Two Peoples Bay NR as a haven for remnant populations of threatened birds and mammals, the fox control regime is relatively intensive. A combined aerial and ground baiting operation is carried out at three-monthly intervals, and further ground baiting is carried out about halfway between the aerial baiting dates, so that baits are laid approximately every six weeks. In late autumn, eggs containing 1080 are set out, as long-lived waterproof baits in case wet weather prevents the laying of meat baits through winter, when vehicle movement is restricted due to plant disease hygiene. This fox control regime is supplemented by localised ground baiting as a response to the detection of fox sign. During 1999, aerial baiting was carried out during the weeks commencing April 5th, June 14th, September 27th and December 6th.

The high rate of survival of known potoroos on East Firebreak trapline, where most information has been gathered, indicates that predation of adults is a relatively rare event. This may not be true in relation to young potoroos, especially during their dispersal phase.

Plant diseases

Dense vegetation is clearly a vital attribute of potoroo habitat. Where this density is provided by dieback susceptible species, this disease threatens the extent of available habitat. Dieback hygiene is practised in vehicle movements and fieldwork on foot in all parts of Two Peoples Bay NR.

Detailed mapping of *Phytophthora* affected areas on Mount Gardner by Alan Danks and Mal Grant (CALM Albany) continued during 1999. Knowledge of the boundaries of infected areas is essential if fieldwork is to proceed under wet soil conditions as it allows hygiene measures to be performed at the boundary during movement between infected and uninfected areas. About two-thirds of the Mount Gardner area has now been mapped and it is intended that the task will be completed early in 2000.

7. Search for potoroos outside Two Peoples Bay NR.

During 1999, priority has been given to survey within Two Peoples Bay NR and to investigation of the distribution and habitat use of *P. gilbertii* there. Survey in other areas has been limited to the instruction of volunteers in hair-arching techniques. In the short term, this appears to be a useful means of covering more terrain along the south coast, by the use of trained volunteers who are prepared to give their time to the project.

8. Establish new populations by translocation.

Work on this Action is still well in the future, as there is no source of animals for translocation at present. Investigation of potential sites will continue as survey sites outside Two Peoples Bay are visited. Better knowledge of habitat use by Gilbert's Potoroo is needed, in order to select translocation sites. Radio-tracking of individuals at Two Peoples Bay is providing new insights into the variety of vegetation associations utilised by this species. Documentation of this information will allow much more accurate assessment of potential release sites in future.

9. Review the conservation status of Gilbert's Potoroo according to IUCN criteria in 2007

Information to be used in this review is currently being collected, but it is hoped that by that stage, significant extensions of range will have occurred.

10. Review the Recovery Plan

Review of the recovery plan will be an ongoing process. At this stage it has been revised only so that it meets EA's new guidelines for recovery plans.

REPORTS AND PUBLICATIONS

Ellard, K. (1999). Investigations into the oestrus cycle of Gilbert's Potoroo. Progress report 1. Report for WWFA, Wildlife Veterinary Services

Syme, K. (1999). Survey of underground fungi at Two Peoples Bay as the first stage of a dietary study of the critically endangered Gilbert's Potoroo. Report for WWFA, Denmark Environment Centre Inc.

ACKNOWLEDGMENTS

We would like to acknowledge the contributions made by the following people to the recovery program: Grant Regan for back-up care of the captive animals; Katie Syme and Geoff Evans, for successfully gaining funding to carry out their project to document the hypogeal fungi of Gilbert's Potoroo habitat; Dr Anne-Marie Horwitz and Dr David Forshaw for providing veterinary expertise; Dr Kevin Ellard for gaining funding and overseeing the oestrus study and Ernest Stead-Richardson and Prof Don Bradshaw for their input into the faecal hormone analysis, Neil and Doreen Scott at Two Peoples Bay for assistance at all times, especially in feeding potoroos on Saturdays; Alan Danks and other members of the Recovery Team; and to the many enthusiastic volunteers who helped in the field and in the captive colony, without whom much of this work would not be done.

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APPENDIX

Notes on the death of Female #4

Female #4 was brought into the captive population in December 1994. She was already approximately 4 years old, estimated from tooth wear. During December 1998 and January 1999, this animal was consistently losing weight and was becoming anaemic. She died on 9 February 1999 from no apparent cause other than 'old age'. The autopsy report showed that she had 'cancer which originated in the cells forming red blood cells. The cancer had infiltrated the liver and spleen and the potoroo died most likely from multiple organ failure'.

The autopsy also showed the 'presence of two worms, one of which was found free in the peritoneal and one in the thoracic cavity...they were not disease causing in this animal'. **The worms are being identified and the vet will forward the results. The vet found no worms in the gastrointestinal tract.**

Notes on the death of Female #19

#19 was moved to pen 8 by herself on August 18, 1999. At this stage she was a healthy weight and in good condition. By September 1999, she was beginning to continuously leave some food in her bowl and was starting to lose weight at each fortnightly handle. A weight check in the beginning of November had shown she had dropped to 789 grams, had pale gums and conjunctiva. The vet was called out.

In the weeks following, blood and urine were collected and analysed for Blood Urea Nitrate (BUN) and oxalate crystals respectively. Her BUN was very high but there were no signs of oxalate crystals in the urine. This confirmed kidney damage but not oxalate nephrosis. On 24th November 1999, #19 had deteriorated to the point that it was not ethical to keep her alive. The vet anaesthetised her and collected a large volume of blood before euthanasing her.

The post mortem showed that she did have oxalate nephrosis but the vet is awaiting the final report from Agriculture WA to confirm that.