Natural Resources and Environment

Parks VICTORIA

Eastern Barred Bandicoot Recovery Program

Zoological Parks and Gardens Board of Victoria

PROGRAM UPDATE

Welcome to the seventh edition of the Eastern Barred Bandicoot (EBB) recovery program newsletter, the first for many years and also for the new millennium! The program has seen many changes since we produced our last newsletter back in 1995. After coming through a drought in western Victoria and seeing the impact of an overpopulation of kangaroos at one reintroduction site we have suffered some setbacks, however we have also achieved a great deal in the past five years and have much to report.

For those who are unfamiliar with our program, a recovery team oversees the implementation of the EBB Recovery Plan. Its members consist of specialised staff from the Department of Natural Resources and Environment (NRE), the Zoological Parks and Gardens Board of Victoria (ZPGBV), Parks Victoria (PV), private landholders and members of the Friends of the EBB. The recovery effort is comprised of a captive breeding program and a reintroduction program. Eighteen pairs of bandicoots are maintained in captivity across a number of zoological institutions spread around south-eastern Australia and six reintroduced populations are spread across western Victoria.

The effort to save the EBB from extinction has been under way for more than ten years now and every year a review is held to measure the program's progress and review its targets, reflecting an adaptive approach to management of this highly endangered species. At this year's review the recovery team received an encouraging report from the field management working group. Despite the fact that many regions of western Victoria have been suffering from possibly the worst drought on record, occurring over the last 3 – 4 years, the program is now half way towards achieving it's goal of attaining four self-sufficient wild populations by 2002. The Hamilton and Mortlake districts in particular have been among the worst affected by drought, with the lowest winter rainfall ever recorded for four consecutive years. This has had an adverse effect on the wild populations of bandicoots as they only breed during the wet months of the year. The species has a life span of only 3 years and with breeding depressed due to very low winter rainfall, EBB populations can quickly decline. Despite the drought, two reintroduced populations of bandicoots continue to do well with trapping rates returning to pre-drought levels. 'Lanark', a private property near Hamilton and the National Trust property 'Mooramong' near Ballarat, are home to thriving bandicoot populations and these sites have been self-sufficient for 3.5 and 5 years respectively. No new releases have been undertaken at these sites during this period.

The success of these sites is considered to be the result of a high level of vigilance in predator management and the availability of large areas of suitable secure habitat on these properties. With these successes we have demonstrated that if adequate and appropriate habitat is provided and predator control is continually maintained at such a level whereby bandicoots can reproduce and recruit offspring into the population, the species can persist in the wild. Our experience challenges the view that reintroduced populations of endangered species can only be saved if they are protected by fences. Our aim is to truly recover the species in the wild and establish a number of separate unfenced populations of bandicoots across their former range. We are on our way to achieving this as currently our most successful sites are those that are unfenced.

In addition to our success with reintroduction, we are extremely pleased to have recently learned that an application for funding from the Endangered Species Program of Environment Australia has been partly supported. To date we have accumulated many years of experience with captive breeding and reintroduction of the species as well as with predator control. However, the program is now entering a new phase where closer investigation into the reasons behind the relative success of some reintroduction sites over others is required. We hope to be able to use this funding to help us find some answers to such questions. This will then enable us to fine-tune our recovery strategy to ensure that we maximise our limited resources for all future efforts.

Mandy Watson
Program Convenor

LANARK

The Lanark reintroduction site is a private property at Branxholme approximately 25 km southwest of Hamilton. The property owners, the Fentons' have a unique understanding of the need for retention and protection of wildlife habitat on the farm. This is one of the reasons that Lanark was the first private property to be selected as a release site for the Eastern Barred Bandicoot. As a result of a program of fencing, tree planting and re-filling of wetlands over 30 years, many bird species and a number of mammals, reptiles and amphibians have returned to the area. Only small areas (10% of the total area of the property) have been set aside but this has created excellent habitat for a wide range of species. These habitat areas on the property were selected as bandicoot release sites as they provide suitable nesting habitat and plenty of cover to allow bandicoots to escape from predators, as well as the right environment for soil borne invertebrates, which are the bandicoot's staple diet. A regular fox and feral cat control program is carried out by Cicely and David Fenton which benefits both the bandicoot project and the farm's lambing enterprise. Adjoining property owners also taking part in the predator control program have reported greatly improved lambing percentages. This has had other spin offs for the property, for example Sacred Ibis which are great natural insect pest controllers have been able to breed more successfully at Lanark since fox and cat numbers have been kept down.

It is exactly six years since the first bandicoots were released at Lanark. Now during our quarterly monitoring programs we no longer catch any of the captive-bred founders released there. All bandicoots caught have been bred in the wild on the property and although total numbers captured were down during the drought of the past few years, they have now returned to a very healthy level and breeding and recruitment continues. At the last trapping in September, 9 individual bandicoots were captured and 3 of these were 'cleanskins'. Of the 9 individuals caught, 2 were females and these were both carrying 3 pouch young each.

Mandy Watson
Natural Resources and Environment

Eastern Barred Bandicoot and young
Photo courtesy of Jim O'Brien

Some six years ago we were asked to become a release site for the Eastern Barred Bandicoot Recovery Program. At the time I was hesitant, as I could see a change in management would have to take place. How wrong I was. A few minor adjustments yes, but the benefits far outweigh the minor changes. We have had the most wonderful support from the recovery team involving members from the Department of Natural Resources and Environment, Healesville Sanctuary, Melbourne Zoo and Parks Victoria. This is one of the few programs that include all the parties involved and welcomes our input from the field. This helps me learn from them and maybe they pick up a few answers from me.

We have had a few ups and downs but who was to know we were heading into the driest four years on record. This I am sure was the cause of the decline in numbers over the last 12 months. I am happy to say this little hiccup is behind us now and the numbers are on the increase once more. The major problem all along of course is foxes and cats; the destruction that is done by these ferals is quite devastating to our wildlife in general. The funding received for predator control, whether from Landcare groups or private landholders helps to keep some of these endangered species alive.

The EBBs of Lanark and I thank the recovery team members for their support and dedication. I know how much affection you all have for these little mammals; they really do win you over with their gentle approach to life.

Cicely Fenton
Private Landholder

MOORAMONG

When the western Victorian plains were first settled by Europeans, the grasslands, wetlands and grassy woodlands that provided habitat for wildlife were inhabited by native mammals, ranging in size from Eastern Grey Kangaroos to the tiny Fat-tailed Dunnarts, and including bettongs, quolls, rats – and Eastern Barred Bandicoots. These specially adapted marsupials were abundant across the plains, generally (although not exclusively) being found in the grassy habitat developed on the volcanic soils that spread from the border regions of South Australia to Melbourne. The changes in that habitat that began with the introduction of Sheep, altered fire regimes and the introduction of exotic predators and competitors, culminated in pasture improvement and the use of pesticides and herbicides had a major effect on the wildlife. The bandicoots, in particular, vanished from much of their range – from South Australia by the 1890s and gradually, westwards, over the next three or four decades until, by the 1950s they were confined to the far western part of their former range and by the late 1970s, to the City of Hamilton. We do not know just when the last bandicoot disappeared at *Mooramong*, but it is very likely that the extensive grass fire in January 1944 was enough to cause local extinction.

By the time that a recovery program for the Eastern Barred Bandicoot was proposed, in the early 1980s, a major problem was finding a place (or places) at which to try out the ideas that had been developed about reintroducing the species – remember, there was no recipe book available for such an exercise. This was to be a long-term experiment, on a landscape scale – in a landscape that had been so altered that we were unsure if there was any hope of success, let alone the statewide recovery of a nearly extinct species.

Although we knew that the bandicoots could survive in an altered environment, such as at Hamilton, the population there was declining and it was reckoned a better proposition to try our experiment in areas where the vegetation was more or less native. The first sites chosen were Gellibrand Hill Park (now Woodlands Historic Park) adjacent to Melbourne Airport, and the Hamilton Community Parklands. Both these sites were surrounded by predator-resistant fences, to protect the bandicoots as the reintroduced populations grew. However, it had always been the intention to initiate a number of reintroductions – known as satellite colonies at that time – and when the Mooramong Nature Reserve Sub-committee suggested, via the draft Management Plan for the Scobie and Claire McKinnon Nature Reserve, that '*The Reserve is now the most suitable site in Victoria for this reintroduction...*', the Department agreed, and thus began the next phase in the program.

A Management Protocol was prepared, following the guidelines in the State Management Plan, and a Flora and Fauna Guarantee Incentive Scheme Grant was made to the National Trust, enabling the construction of a 2ha enclosure within the Nature Reserve. The intention was to breed bandicoots for release, and this exercise began in September 1989, with the importation of a pair of animals from Hamilton. Soon, more pairs were introduced and breeding began. Within the next 18 months, nearly 20 young were born. Some were transferred to Hamilton Parklands and Woodlands, but a number either died or just disappeared. It was decided to stop breeding bandicoots in these pens, and to use them to hold animals bred elsewhere until their future at *Mooramong* could be determined.

Mooramong
Photo courtesy of Gary Slater

A release at *Mooramong* was planned for late 1992, and an intensified predator control program, using 1080 poison bait (*Foxoff®*) in addition to increased shooting was implemented. This was essential because, for the first time, we were attempting to establish bandicoots in an unfenced area, and our experience had taught us that foxes and bandicoots do not mix. As part of the site preparation we had also set up a location grid across the reserve, to help determine just where bandicoots were nesting and moving.

On 8 December 1992, after being examined by Melbourne Zoo veterinarians, 15 bandicoots (12 females and 3 males) were released into the Nature Reserve, in the area known as Penny's Block. Five animals (3 female, 2 male) were fitted with small radio-

transmitters. Over the next few days, animals with transmitters were located and traps were set to capture and examine the animals, to check their condition. One female died from self-sustained injury but the others settled into their new home well and all but one of the females had pouch young within a month of release (she never bred).

We continued to monitor the bandicoots monthly and, over the ensuing 12 months, a further 30 bandicoots were released at the site. By February 1994 we had introduced 49 bandicoots to the delights of living wild at *Mooramong*. For some, life was not easy. Some failed to settle and succumbed to weight loss and/or exposure, others were taken by foxes – despite our continuing efforts to keep fox numbers under control. However, the population did become well established and breeding soon demonstrated that the place offered the right kind of habitat and food. Our first capture of a locally-bred animal occurred just four months after the release! In the first year, over 100 young were born, and 18 months after the reintroduction began, over three-quarters of the population had been born at *Mooramong*, including second and even third generation locals.

The opportunity to learn as much as we could about reintroducing bandicoots was enhanced by the enthusiasm of staff and students at the University of Ballarat, and a series of research projects were carried out, investigating aspects of population demographics, movements, home range, habitat use and diet. Some more sophisticated radio-telemetry experiments were also carried out, and helped us to understand more about what bandicoots did when they were released. Predictably, some settled down straightaway, others used up a great deal of energy exploring before finding a suitable part of the area in which to establish themselves.

It seemed that the experiment had been a success, and that Eastern Barred Bandicoots had been returned to *Mooramong* with a minimum of fuss. Most preferred to occupy the best available habitat, on the revegetated rocky barriers in Penny's Block and Big Rise. But the amount of habitat available was not great, given that much of the reserve is normally wetland and in 1994 we placed some bandicoots in the Cottage Dam area, from whence they were able to expand into the gardens surrounding the homestead and associated buildings. What an exciting day it was when we first saw evidence of this expansion – characteristic bandicoot diggings among the shrubs adjacent to the driveway. Indeed, the homestead gardens were to be the saving factor in the years to come, for after 1996, it seemed that rain had forgotten how to fall over western Victoria. *Mooramong* was no exception, the former wetlands gradually dried out and bandicoot numbers dwindled. By 1999 the only place that they could be found was in and around the homestead. A small amount of the precious water supply was used to provide a damp line of ground in the homestead garden, via a soaker hose. This was sufficient to enable the bandicoots to dig, and within 24 hrs the entire length of the hose looked as if it had been rotary hoed!

Despite the drought and restrictions on food, the bandicoots continued to breed – not all, and not as successfully, but that in itself shows us that *Mooramong* still has the capacity to support a population – and when the rains come again, the population will respond and expand to once again occupy the whole of the nature reserve.

Mooramong is a critical part of the Eastern Barred Bandicoot recovery program. The security and quality of the habitat that has been retained and restored in the Nature Reserve is clearly to the bandicoot's liking. The availability of the homestead gardens in a climatic emergency, and the dedicated site management by the resident ranger, and the others charged with caring for *Mooramong* in all its guises make it still 'a most suitable site' for these attractive marsupial residents of the western plains.

John Seebeck
Natural Resources and Environment

If you would like further information on the Eastern Barred Bandicoot Recovery Program, please call Natural Resources and Environment, Customer Service Centre on 136 186.

MOORAMONG continued

Trapping at Mooramong continues to occur every three months which covers about a third of the reserve. Bandicoot numbers have slowly increased until a high of 36 animals over two nights were trapped in March 1998. The drought over the past couple of years has had a detrimental effect on the Bandicoot population. The lakes in the reserve dried up and the numbers captured at each trapping round dropped to an all time low of three Bandicoots in September 1999.

Since then numbers have started increasing, with 19 Bandicoots caught in April 2000. Bandicoots started being sighted in and around the Homestead, farmhouses and surrounding gardens. Anywhere that watering was occurring. Numbers have since remained around this mark. The Bandicoots are making their way back into the reserve and with the recent rains starting to refill the lakes on the reserve the numbers should continue to improve.

The success of the program at Mooramong is largely due to the efforts and dedication of the on-site Ranger, Adam Merrick. Due to Adam's constant predator control works, predators are kept at very low levels.

All things considered, the future looks bright for the Mooramong Eastern Barred Bandicoot!

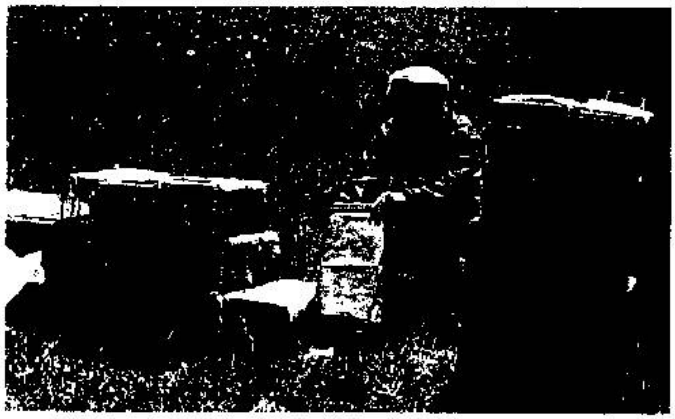
Jim O'Brien
Natural Resources and Environment

COBRA KILLUC

Cobra Killuc is the most recently established reintroduction site for the Eastern Barred Bandicoot. It is an area of 500 hectares of varied vegetation types, located North-west of Mortlake and is managed by Parks Victoria. An area within this reserve of approximately 100 hectares contains remnant native grassland and grassy woodland, the original habitat of the Eastern Barred Bandicoot before European settlement. This area was selected as the best release location for bandicoots at the site and the first release of 30 animals occurred in April 1997. An extensive predator control program was undertaken on-site and throughout the district prior to the first release and an ongoing predator control work is carried out on the reserve. A number of other releases of bandicoots were undertaken over the next two years with a total of 105 bandicoots reintroduced to the area by May 1999. Trapping rates initially remained relatively stable (around 2 – 4 individuals captured per 100 trap nights*) but since 1999 trapping returns have dropped off significantly, down to less than one bandicoot captured per 100 trap nights.

As with all other reintroduction sites, fenced or unfenced, regular predator control work is undertaken at Cobra Killuc. The predator program consists of *Foxoff®* baiting, den destruction and spotlight shooting. The site is very large, remote and unfortunately does not have a permanent on-ground staff presence. The drought has undoubtedly contributed to the lack of persistence of this population and Kangaroos living within the reserve may also be a complicating factor. An assessment of the habitat and nutritional characteristics of the site and a comparison with other more successful sites is currently being undertaken as an Honours student research project with Melbourne University. No further releases of bandicoots will be undertaken at this site until this research is completed. Predator control is also currently under review.

**trapping results are expressed as a measure of return for effort ie: number of individuals caught per 100 trap nights, in order to standardise results across all sites.*



Trapping at Cobra Killuc
Photos courtesy of ZPGB, Conservation

HAMILTON

Eastern Barred Bandicoots at Hamilton have struggled in recent years. They enjoyed a comeback following the wet years of 1995 and 1996, only to head into one of the driest 46 month periods in the last 116 years. Only two drier periods have been recorded (peaking in 1914 and 1967). Bandicoot numbers dropped and the population was just hanging on.

Drought broke for the bandicoots with above average rains in April and May 2000, followed by good spring rains. Breeding has increased bandicoot numbers and young are being observed in the wild population. We recently discovered the wild bandicoot population has extended outside the former known range.

While bandicoots battled the elements, the humans battled local authorities on the need to save bandicoot habitat. Ever changing positions in council mean that there is a continuing education program to encourage authorities to consider bandicoots in planning. Council is kept informed by residents of the presence of the wild population. The Grange Burn area has been topical in 2000.

Support is being received from students, residents, green and local groups as bandicoots awareness continues. Bandicoot prowls are a winner with participants. The bandicoot story is gaining momentum as our Eastern Barred Bandicoots make a comeback at Hamilton.

Kay Aldridge
Friends of the Eastern Barred Bandicoot

HAMILTON COMMUNITY PARKLANDS

The Hamilton Community Parklands (HCP) reintroduction site is located on the northern outskirts of the township of Hamilton. It became a reintroduction site in 1990/91 when 100 hectares of grassland and wetland habitat was fenced off with a 1.8m electrified predator fence and approx 50 bandicoots were released. Since that time the population within this reserve has appeared to fluctuate considerably over the years. Trapping rates have ranged from a high of 8 individuals per 100 trap nights to a low of less than 1 individual per 100 trap nights*. After trapping rates dropped down to 1 individual per 100 trap nights in October 1994, the site was supplemented with another 28 bandicoots. The population quickly rose again and remained high until 1997 when numbers dropped off significantly once again. Trapping rates have remained low over the past 3 years and this is thought to be a result of the drought. No further supplementation of the population has been undertaken.

The good news is that at our last trapping of the HCP this month, numbers were back up again. A total of 7 individual bandicoots was captured, (2.8 per 100 trap nights) 6 of these were new bandicoots, known as 'cleanskins' and of the 7 individuals caught, 4 were females, all carrying pouch young. Conditions were excellent after the good rains we have experienced so far this year, so here's hoping that the drought has ended and the population continues to increase. Due to concern about low trapping returns at HCP and reports of up to 33 bandicoots being seen at night by our fox control contractor, we undertook a spotlight session during this last trapping program. With the help of the Hamilton Field Naturalists Club a total of 11 bandicoots was seen.

There is some concern about the long-term viability of this population and at 100 hectares in size, the Parklands may be too small to ever support a large number of bandicoots over a long period of time without supplementation. However, it is most encouraging to know that without supplementation the population can survive and recover on its own, even after a long drought.

**trapping results are expressed as a measure of return for effort ie: number of individuals per 100 trap nights, in order to standardise results across all sites.*

Mandy Watson
Natural Resources and Environment

CAPTIVE BREEDING

There has been a lot of activity in the captive-breeding program since the last Newsletter was published in 1995. Since this time, we have bred 313 bandicoots (132 males, 154 females and 27 not sexed), released 209, made 143 transfers, captured 28 from the wild and had 114 deaths. Table 1 summarises the captive population inventory since 1988. The current captive population stands at 68 (December 2000).

Table 1.
Eastern Barred Bandicoot captive population inventory, 1988 to 2000.

Total number registered in studbook	895
Total captive births	728
Total releases	437
Total deaths in captivity	396
Total transfers/movements	489

Since 1995, the captive population has maintained its breeding potential of producing in the order of 40 bandicoots for release per annum. There have been no major health issues for the population apart from those related to aging. In the wild, a bandicoot that is 2 years of age may be considered old. In captivity however, old age is 3 - 4 years. The oldest recorded bandicoots in captivity lived to the ripe old age of 6 years.

During the 5 years since the last Newsletter, there was a major effort to establish a new release site at the Cobra Killuc Wildlife Reserve. A total of 98 bandicoots were released from the captive population, the majority in 1997 and 1998. Unfortunately, despite the large number released, the site has not been successfully established. The reasons for this were not well understood. Fox predation was certainly on top of the list, however dispersal from the trapping grid and poor trap success were also considered as a cause for low numbers being recaptured. A radio tracking study was undertaken on selected bandicoots in the summer of 1998 and winter of 1999 to primarily determine the fate of captive-bred bandicoots released into Cobra Killuc. The results confirmed that fox predation remains an issue.

An interesting research project involving the insertion of a radio transmitter package into the intraperitoneal cavity of bandicoots was trialed at Melbourne Zoo in 1999. Five bandicoots were selected for the trial. The operation and insertion of the package was successful, however the transmitter package failed and no signals were being received from the transmitters (a manufacturing fault).

Insertion of radio transmitter
Photos courtesy of Peter Myroniuk

One of the experimental bandicoots died, unrelated to the transmitter insertion, however the other four are alive and well. The advantage of intraperitoneal transmitters is their potential for long life. Externally attached transmitters have a life on a bandicoot of 2 - 4 weeks, whereas it is potentially possible to obtain several months life from internal transmitters. Further work in this area is currently being planned.

Peter Myroniuk
Zoological Parks and Gardens Board of Victoria

WOODLANDS HISTORIC PARK

A great deal of water has passed under the bridge at Woodlands Historic Park since the last recovery Program newsletter was produced back in October 1995. In 1996 the bandicoot population there peaked with an estimated 500 plus individuals. However, as a result of a number of factors, primarily drought and habitat destruction caused by the rising population of Eastern Grey Kangaroos, the population rapidly declined during 1997 to a point where, by January 1998, no bandicoots at all were captured during monitoring.

Although this species has evolved to cope with changing climatic conditions, the Woodlands Historic Park bandicoot population could not cope with the intense competition from the kangaroos in conjunction with unfavourable seasons and was depleted to the point where it was unable to recover on it's own. A kangaroo management program was eventually undertaken and now that kangaroo numbers are significantly reduced in the 'Back Paddock' more bandicoots can be released to assist with the recovery of the population.

A release took place in December 1999, when 33 captive bred bandicoots were liberated into an area of the 'Back Paddock' where there were signs of good habitat recovery. Subsequent trapping programs have only managed to pick up 4 or 5 of these bandicoots at any one time. One of the perpetual problems with reintroduction is a lack of information on the survival of released individuals and trials are currently underway using a new type of radio-transmitter never before used on this species, which will be tested in the field at the next release.

Although numbers of bandicoots being captured during monitoring programs have remained low for the first 12 months since the release, it appears that recovery of the population is progressing. After good rains last year there are indications that bandicoots have moved away from the original release location. The first cleanskin was trapped in October last year.

Mandy Watson
Natural Resources and Environment

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Editor:
Merril Halley, Natural Resources and Environment
Production Editor:
Lorraine Slater, Zoological Parks and Gardens Board of Victoria

GLENELG-HOPKINS CATCHMENT MANGAGEMENT AUTHORITY

The Glenelg-Hopkins Catchment Management Authority (GHCMA) is a strategic regional organisation with a charter to facilitate integrated catchment management. Our key partnerships are with the regional community, local, state and federal governments and Landcare groups.

Community education and awareness are high on the GHCMA agenda. Expanding our knowledge and partnerships across the region will result in the environmental, economic and social sustainability of our catchments.

The GHCMA was formed in 1997 under the Water Act 1989, when the Victorian Government integrated the roles of the community-based advisory groups and community-based service delivery groups to create a new CMA. We are one of nine CMA's covering non-metropolitan Victoria to provide strategic leadership for sustainable land and water management in Victoria.

The GHCMA is responsible for an area of 25,000 square kilometres in south-west Victoria encompassing the Glenelg, Hopkins and Portland Coast drainage basins south of the Great Dividing Range.

As well as our usual spending on environmental works, the GHCMA has been the proud sponsor of the Red-tailed Black Cockatoo Recovery Team. We have also recently announced that we will be the major sponsor for the Hopkins One-Mile Swim, held in Warrnambool every year, in a bid to highlight river health in the region.

We at the GHCMA are very proud to be able to add the Eastern Barred Bandicoot Recovery Team to our growing list. The assistance we have provided will facilitate the Bandicoot Teams ability to reach a wider audience and continue it's excellent work in ensuring the survival of one of our native gifts.

Simon McKinley
GHCMA

Glenelg Hopkins

CMA

Thank you to Glenelg Hopkins Catchment Management for the sponsorship of this edition of the Eastern Barred Bandicoot Newsletter.