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Nigel Colsell
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DEPARTMENT FOR
environment
and heritage

Malleefowl Re-introduction

Eyre Peninsula

August 2001 Report

National Parks & Wildlife South Australia

ARK ON EYRE
Eyre Peninsula South Australia

NATURE FOUNDATION SA INC

Malleefowl Re-introduction Eyre Peninsula

2000 – 2005

Report compiled by N. Cotsell

Cover photos:
Malleefowl *Leipoa ocellata* (N. Cotsell)

EXECUTIVE SUMMARY

On the 23 January 2001, National Parks and Wildlife officers and community members collected 29 eggs from three malleefowl mounds near the township of Lock on Eyre Peninsula. This small milestone represented the first stage of a five year program to re-introduce malleefowl back to suitable mallee areas on the Peninsula where landholders and local community are sympathetic to their plight. Currently, there are five healthy birds ranging in age from six to nine months being raised in an aviary at Wangary. *Ark on Eyre*, a marketing and promotional banner for biodiversity conservation initiatives on Eyre Peninsula has galvanised local community support by promoting and resourcing the re-introduction program and encouraging the formation of a network of volunteers and other people interested in Malleefowl conservation. Furthermore, a better understanding of the plight of malleefowl has been raised through a malleefowl website, regular newsletters, newspaper articles, radio interviews and a documentary to follow the progress of chicks from egg collection to eventual re-introduction. Many local businesses have contributed materials for the construction of the aviary and food for the growing birds. School children have been raising mealworms and participating in other projects to better understand and appreciate the importance of habitat and predator control in helping wild populations survive. With historical and ongoing predator control work undertaken in Lincoln National Park the first batch of malleefowl will be re-introduced in the near future marking a return of the birds after an absence of 30 years. In 2002, additional eggs will be collected and incubated with the help of volunteers with expectations of higher success rates as experience gained from the first year of incubation and malleefowl husbandry techniques are fine tunned. A second aviary to house additional chicks is currently being considered to bolster the number of chicks that can be re-introduced. This will give the program flexibility to separate age classes following the staggered hatching of chicks. Some of these birds will eventually be made available for heritage agreement landholders through the Mallee Biodiversity accelerating program as communities' work toward habitat protection and predator control. Malleefowl will be employed as a 'flagship' species for this program to promote biodiversity and conservation programs across the region.

ACKNOWLEDGEMENTS

Ark on Eyre would like to thank the following people, organisations and businesses for their ongoing assistance and support for this project:

Tom Bott (Bird husbandary and aviary construction)
Tony Figl (Incubation)
Friends of Southern Eyre Parks
Southern Eyre Birds
Port Lincoln Aboriginal Community Council (Documentary)
Rob Wheeler (NSW NPWS)
Wayne Fowler (Aviary Construction)
Warramboo CWA
Lincoln Gardens Primary School
Lock residents
Lincoln Veterinary Clinic
Port Lincoln Bird Club
DEH (Port Lincoln, Venus Bay & Adelaide)
Bushcare
Dubbo Zoo (Technical advice)
ABC Radio (Promotion)
Adelaide Zoo (Post mortem)

Sponsors

Nature Foundation SA Inc. (Finance)
Lincoln Rural Supplies (Aviary)
Leader Distributors (Stubby holders & foam)
Merv Clayton (Ant Control)
Cummins Mill (Feed)
Lock school (Accommodation)
Arthur Gibbs (Mealworms)
Larry Bebbington (Water trough)

INTRODUCTION

Aims and objectives

1. To provide an update on the progress of the malleefowl re-introduction program on Eyre Peninsula; and
2. To meet reporting requirements for the Department for Environment and Heritage Wildlife Ethics Approval (Ref: 15/2000) and Nature Foundation SA Inc.

Background

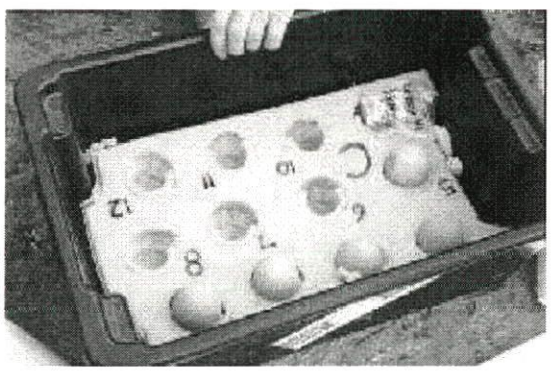
Much of the former habitat of malleefowl on Eyre Peninsula has been cleared, although the species has persisted in isolated patches particularly in the central and northern regions of the peninsula. A malleefowl survey questionnaire on Eyre Peninsula (Greencorps & NPWSA 1998) reinforced the importance of the northern Eyre district as an important stronghold for the peninsula's malleefowl population. The malleefowl re-introduction program commenced on 23 January 2001 with the collection of 29 eggs from 3 mounds located north of the township of Lock, see Figure 1. This is the first year of a five-year program to introduce malleefowl back to areas where they have subsequently become extinct as a result of habitat destruction and predation by cats and foxes. Identifying suitable areas for re-introduction will be done strategically and developed in association with the *Mallee Biodiversity Accelerating Project.* Preference will be given to landholders with large blocks of mallee where an ongoing and committed predator control program is in place, however, in the first two seasons Lincoln National Park and Venus Bay will be targeted for the first release of birds. The establishment of self-sustaining breeding populations will measure the success of the program although such a result may not be obtained for 3-5 years following re-introduction.

METHODOLGY & RESULTS

Egg collection

Approximately 20 people from NPWSA Friends of Parks, bird groups and local farmers met along Zerk Road where three active malleefowl mounds were known to exist within a 1 kilometre radius. Local bird enthusiasts had been monitoring each of the mounds since they had become active in the spring. Following a short briefing by Mr Rob Wheeler (NSW NPWS) and Regional Ecologist Nigel Cotsell, 3 teams of 5-6 people were established and designated a malleefowl mound. Each group was supplied with a plastic tub containing a foam core with pre-drilled holes to accommodate the eggs, scales, cotton bags, data sheet, pencils, thermometer, portable radio and shovels. Following extraction from the mound each egg was weighed, being careful to maintain the same orientation and marked with a soft pencil before being placed in a holding tub and kept in the shade.

Figure 2. Holding tubs for malleefowl eggs

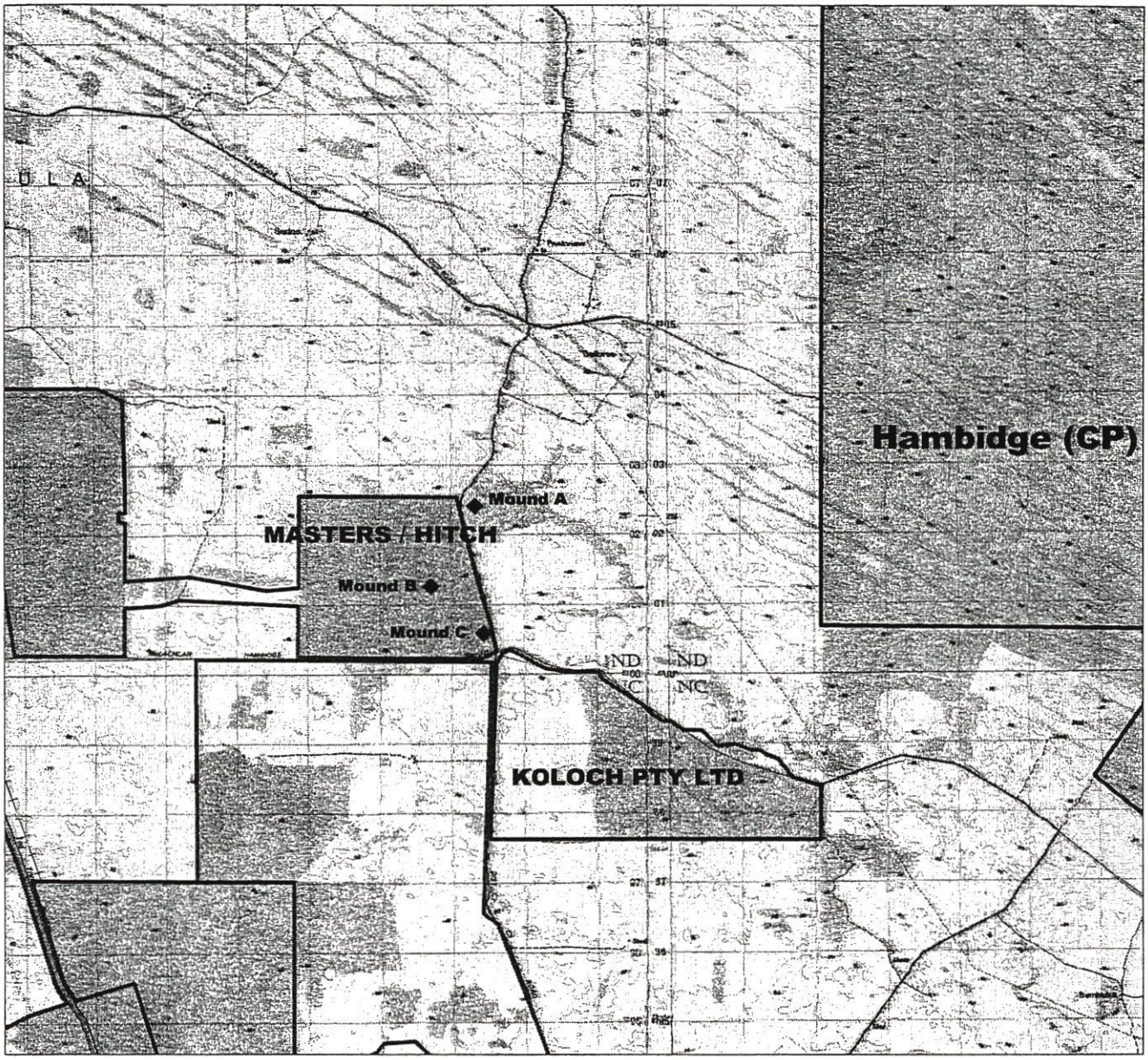


The number of eggs collected from each mound is as follows:

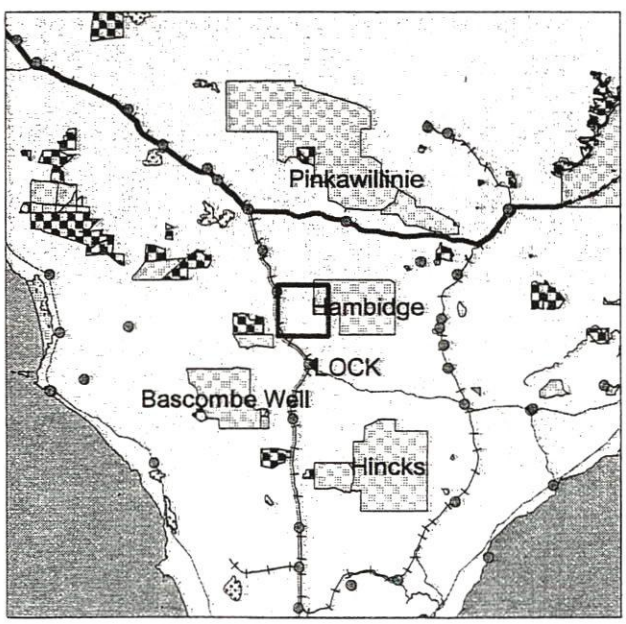
Mound	No. eggs	Comments
Mound A	11	4 eggs left
Mound B	9	-
Mound C	9	-

The orientation of each egg was maintained as it was found and weighed using 2kg scales. The weight of each egg is shown in Figure 3.

Figure 1. January 2001 Malleefowl Mound egg collection sites



Location Map



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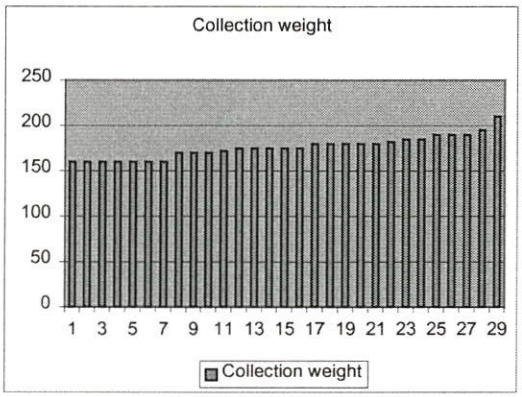
Map Produced from PAMS
Projection: Longitude / Latitude (AGD 84)
Date: 2 August, 2001
Malleefowl Mound.wor

Figure 3. Collection weights of malleefowl eggs from mounds near Lock



Appendix 1 details the specific dimensions and weights of each egg following extraction from the mound and details the stage of development reached.

Each box of eggs were placed into a vehicle and driven for 1.5 hours to an incubator 15 kilometres west of Port Lincoln . During transportation the inside temperature of each box was monitored to maintain an optimal temperature.

Incubation

Tony Figl, a local emu farmer offered the use of his incubator for the malleefowl re-introduction program. The incubator is custom made and built from a standard chiller incorporating accurate temperature and humidity sensors. The 29 eggs were removed from the large holding bins and placed in polystyrene 'stubby' holders and tapped over with sturdy sticking tape to prevent chicks escaping once they'd hatched. Each numbered egg was placed in a 'stubby' holder and marked with the letter of the mound it was extracted from and the number of the egg. A 5mm hole at the base of each 'stubby' holder allowed amniotic fluids to drain post hatching. Ideally incubation should be at a temperature between 34°-35°C at all times with humidity no less than 85% but preferably 95%. The temperatures recorded from the time the eggs were placed into the incubator to 8 February 2001 are shown in Table 1.

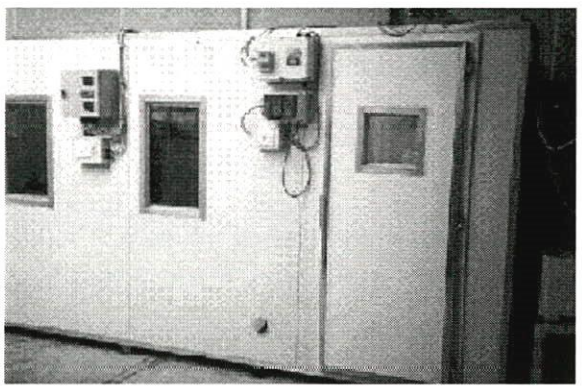
Table 1. Recorded temperatures from 23/01/01 to 08/02/01

	Temp(°C)	Date
Min	31.12	23/01/01Day of egg collection
Max	35.27	8/02/01 Thursday – fire in LNP
Average	33.27	

Note: Humidity levels were not recorded, however, they remained above 90% for most of the incubation period.

Once each chick had obtained a dry fluffy head and body, usually about 24 hours after hatching, they were released from the 'stubby' holder and transferred into a smaller box, which was left in the incubator for an additional 24 hours.

Figure 4. Converted emu egg incubator managed by local farmer Tony Figl



Aviary

Local builder Wayne Fowler with the assistance of aviary manager Tom Bott completed the aviary just days prior to the first chick emerging from the incubator in January 2001. Features of the aviary include its large size (20m x 20m x 4m) sturdy construction, shade cloth covering half the roof and all four sides, incorporation of a variety of trees. The aviary is also built within a predator proof fence enclosing an area of

approximately 29 hectares, which keeps cats and foxes well away from the aviary. Other features include two

Figure 5. Malleefowl aviary built at Wangary

smaller relocatable coupes to hold the chicks for the first 48 hours and a larger (5 x 5 metre) internal sectioned off area to separate smaller malleefowl from more mature birds.

Ant infestation

The first two chicks to be released into the aviary experienced considerable stress as a result of small black ants covering their body and feathers. The species of ant responsible for the attacks have been collected and forwarded to the SA Museum for identification. The two chicks subsequently died as a result of their contact with the ants. Realising the severity of the problem for future chicks introduced to the aviary, local pest controller Mervin Clayton supplied NPWSA with COOPEX insecticidal dusting powder which was spread on ant nests and trails within the aviary during peak times of ant activity. The dusting powder was spread using a 'puffer', which ejects a fine cloud of powder. The chemical ingredients of the insecticide are 1% permethrin (25:75) and at least 60 % talc with other ingredients of less than 10%. A stronger chemical has been used outside the aviary to control further infestations.

Chicks

On the aviary front, there are now 5 healthy chicks which are almost fully grown, adjusting to their new surroundings and keeper Tom Bott. Some early problems were experienced with younger chicks, but it appears that once they get past the first few critical days the road to survival seems much more assured. These birds are very susceptible to handling so a decision was made very early to minimise disturbance to the birds. Accordingly, unless there were obvious signs that an individual was in poor condition, the birds were not measured or weighed.

Figure 6. Three day old chick in aviary

Figure 7. Malleefowl at 4 months

Post mortem

Early post-mortem undertaken by David Shultz from the Adelaide Zoo of 2-4 day old chicks were inconclusive,

however, there appeared to be some kidney problems, which could be associated with stress, dehydration or toxins. Relief from ants should also help some of the young chicks adjust to the aviary. Attempts to alleviate stress by minimising handling and keeping conditions clean and hygienic will be a priority next year. Care will be taken when handling the eggs and handling minimised to prevent yolk sac infection.

DISCUSSION

Egg collection in review

There has been some problems associated with eggs harvested from the mound closest to the wheat field (Mound A), see figure 1. There has been only 1 chick establish in the aviary from this mound. There were two other hatching events, however these chicks were very lethargic and subsequently died in the incubator. Additionally, seven eggs from Mound A had no chick formation with yolk only, see Appendix 1. There are several theories regarding the cause including everything from inbreeding, immature parent birds to pesticide contamination. This will need further investigation before any positive conclusions can be drawn and will include laboratory analysis of eggshells and some discussions with the local farmer.

Community support

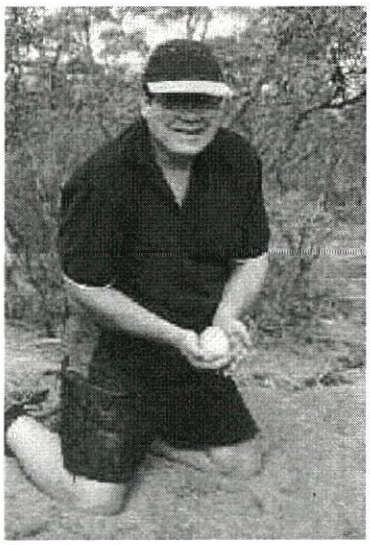
The project continues to receive excellent community support with grain being provided by Cummins Mill and local bird buff Arthur Gibbs assisting with mealworm supply to name just a couple of helpers.

Website

Friends of Southern Eyre Parks member, Graeme Tonkin, has done a magnificent job preparing and maintaining the community web site with lots of informative text and progressive pictures of the birds which have now acquired their adult feathers and look almost fully grown. There are also pictures and text relating to the incubator and mounds found in Lincoln National Park after the fire and other active mounds on Eyre Peninsula. The site has provided an opportunity to reach a larger audience and promote the project. *Ark on Eyre* hopes to house the site on its own website once executive approval has been granted. The current site is located at:

www.chariot.net.au/~gtonkin/malleefowl

Figure 8. Lock science teacher David Murray assisting NPWSA with egg collection



Documentary

Cameraman, Jason Ramp from Port Lincoln Aboriginal Community Council (PLACC) has captured footage of the malleefowls progress from egg collection to mature birds in the aviary. This includes footage from the incubator and aviary and field days held with one of the local primary schools. These stories will be edited together to create a short documentary on the progress of the re-introduction program and will be a joint Ark on Eyre and PLACC initiative. Both Tony Figl and Tom Bott, who are responsible for the incubator and aviary respectively, featured prominently. It is hoped to release some of the footage to local and state television stations in the near future.

Figure 9. **Jason Ramp from PLACC filming local Lock farmer Daryl Dolphin excavating Mound C.**

School participation

Lincoln South Primary School were filmed by Port Lincoln Aboriginal Community Council cameraman Jason Ramp on an excursion to Lincoln National Park. They visited some of the old malleefowl mounds that became visible as a result of the 2001 Lincoln National Park fire. They learnt about the biology and life cycle of the malleefowl and how the bush recovers after a fire, subjects they had been learning about over the last couple of weeks. The children have also been beeding mealworms in the classroom for the malleefowl chicks. Investigative work by the classroom has also revealed some of the local Aboriginal names for malleefowl, they include; Kalbanya (Panggkala); Kalbin (West Coast); and Koolbing (Wiranga) To reward their contributions to the project the children visited the aviary in May.

Figure10. **Children and teachers from Lincoln Gardens Primary School viewing Malleefowl at the Wangary aviary**

Figure 11. **Aviary manager Tom Bott discussing malleefowl with Lincoln Gardens Primary School children**

FUTURE DIRECTIONS

(i) When and where to re-introduce the 5 malleefowl held at the Wangary aviary?

There are several options available including:

Option 1
The malleefowl remain in the aviary until October 2002 followed by transfer to a proposed second aviary to be built at Wanilla forest. This will allow the second batch of chicks to be introduced into the Wangary aviary without interference from the 2001 birds. Release of the 2001 and 2002 birds can then occur simultaneously into the Park allowing for a more cost-effective monitoring program. The delay will also provide additional time for the proposed remote satellite tracking system to be established in the Park in preparation for the release of SA mainland tammar wallabies.

Option 2
Release directly into the Park in January 2002 following the Acacia seed drop. This will have the advantage of freeing up the aviary for newly introduced chicks and guard against the 5 birds imprinting by remaining captive for 2 years. The cost effectiveness of monitoring 5 birds for several months will be the biggest drawback of this option.

(ii) To refine egg collection and husbandry techniques to increase the survival rate.

Based on the information compiled in this report and experience in the field a better understanding of egg collection, incubation and bird husbandry has been obtained. This information will be incorporated into future on-ground works and reporting.

(iii) To build a second aviary at the Wanilla Aboriginal Reserve.

Negotiations with the Port Lincoln Aboriginal Community Council are progressing to have a permanent aviary constructed on their Reserve. This will be an opportunity to get the local Aboriginal community involved with wildlife management. There is now a permanent employee located at the site who can be assisted by various members of PLACC. The aviary may also assist as a 'half-way-house' for young and fledging by EP Yellow-tailed Black Cockatoos.

(iv) Through spatial analysis strategically identify potential areas for malleefowl re-introduction developed in association with the *Mallee Biodiversity Accelerating Project* and *Venus Bay Integrated Pest Control Program.*

A strategic landscape approach encompassing greater Eyre Peninsula needs to be undertaken to assess potential sites for malleefowl re-introduction. These results will need to be considered in the context of existing and future predator control programs, suitable habitat, and connectivity with adjoining remnants. The level of community support will also need to be gauged for successful re-introduction.

Appendix 1. Egg collection results and incubator hatching dates

					EGG (when taken from nest)		
	Hatching Date	Time	Comments	Stage	Height	Width	Weight
Mound A							
1	20-Feb		dead	2	89.9	60.0	180.0
2	9-Mar		OK	5	91.5	60.0	180.0
3				0	87.0	59.0	170.0
4				0	94.0	59.0	175.0
5				0	91.0	61.0	180.0
6				0	92.0	59.0	175.0
7			dead	3	93.0	61.0	195.0
8			Premat. - died	4	87.0	59.0	160.0
9				0	92.0	60.0	180.0
10				0	87.0	59.0	160.0
11				2	92.5	56.5	170.0
Mound B							
1	9-Feb	8.00am	good	4	89.0	61.0	160.0
2				4	86.0	61.0	170.0
3	20-Feb	8.00am		5	91.5	62.0	190.0
4	13-Feb	9.10am		4	87.5	61.0	175.0
5				0	90.0	60.0	172.0
6				0	90.0	64.0	190.0
7				4	96.5	62.0	190.0
8				0	93.5	60.0	185.0
9				0	94.0	59.0	182.0
Mound C							
1				5	95.0	64.9	210.0
2				0	95.0	62.0	160.0
3				5	94.0	62.0	160.0
4				3	98.0	63.0	175.0
5	14-Feb	5.10		5	95.0	63.0	160.0
6				0	97.0	64.0	175.0
7				4	96.0	64.0	160.0
8	4-Mar	-	weak/needed help	4	97.0	62.5	185.0
9	12-Feb	12.40	good/fluffy	4	95.0	63.0	180.0
Stage							
0	**no formation only yolk**						
1	**some head & eye development, some body shape has formed**						
2	**fully formed body but small with either none or some feather evidence app. 30mm**						
3	**full size and almost ready to hatch**						
4	**had hatched then died**						
5	**survived & in aviary**						

Appendix 2. Malleefowl egg incubation temperatures