Return to Dryandra
Reintroduction of the Boodie and Dalgyte to Dryandra

Progress Report – June 2004

Neil Thomas, Brian Macmahon, Nicky Marlow and Tony Friend

Introduction

The *Return to Dryandra (RTD)* project was established in 1998. A major component of the project was to investigate a range of reintroduction techniques and release methodologies. It was planned to apply these as operational procedures, with the objective to have a practical operational method of releasing the RTD species into *Western* Shield fauna reconstruction sites where fox control is in place at a regional level.

The aims of the project are:

- To compare the success of different release and reintroduction methodologies and to develop optimal strategies for five CWR threatened marsupial species (dalgytes, boodies, marl, mala and merrnine) within Dryandra Woodland.

- To establish self-sustaining populations of five reintroduced CWR threatened marsupial species (dalgytes, boodies, marl, mala and merrnine) within Dryandra Woodland.

Anticipated outcomes for the project are:

1) The identification of the most appropriate reintroduction techniques for the five species (now extinct in the wheatbelt ie. dalgytes, mala, marl, boodies and merrnine) in Dryandra Woodland.

2) An increased public awareness of threatening processes and the steps needed to reverse these processes and to provide educational opportunities.

The project is run jointly by Department of Conservation and Land Management's Science Division and Narrogin District Staff.

Reintroduction of the Dalgyte

Between May 2000 and October 2001, 44 dalgytes were released into Dryandra proper. These releases met with varying success (refer to Progress Report – 28 August 2000), and surveys of the Dryandra Woodland failed to find any evidence that they had persisted within the reserve. Any further releases were postponed until difficulties encountered in the first release was resolved and funding could be found to undertake any additional releases.

In June 2003, a number of issues arose regarding overcrowding at Kanyana Fauna Rehabilitation Centre and the *RTD* Field Breeding Centre. The population within the *RTD* enclosures had reached more than 70 KTBA and it was noted that there was a reduced recruitment rate of new individuals and reduced survivorship of recently released Kanyana bred dalgytes (48% not seen again after 6 months). The most practical cause of action was to reduce the numbers of individuals within the enclosures as soon as possible. Although the funding situation had not been resolved, it was decided to release as many animals as possible in spring 2003. This would alleviate the overcrowding issue with the enclosure, facilitate the survivorship of Kanyana bred animals, and opportunistically test whether a release of a large group of dalgytes would facilitate the establishment of this species within the Woodland.

Fifteen dalgytes were released in August, followed by a further 15 in September and nine in November 2003. Due to limited funding, only five dalgytes (three females and two males) were fitted with tail transmitters and intensively monitored. During the three months of intensive monitoring there were no fatalities of the tail-transmittered dalgytes. All but two stayed within the release area, with one female (Pudka) moving 10.3km from the release site and one male (Yilgerin) moving 5.4km from the release site (Figure 1). These two animals were caught and returned to the release site, with only Pudka dispersing out of range again.

Follow-up trapping has resulted in 14 of the released dalgytes being recaptured. This low number of recaptures is not unexpected as earlier work showed that once released dalgytes are very reluctant to go into standard cage traps. The majority (four) of males had put on weight of between 52g and 570g, with two males losing weight of 10g and 263g. This weight loss is not of concern as the latter had lost only 12.6% of his original release weight.

Three females maintained or put on weight of 22g and 36g. Four females had produced young since their release and two were suckling unattached young. The majority (five) of recaptured female dalgytes lost weight of between 14g and 425g; this weight loss is confounded by the fact that some had large pouch young at time of release and this weight included the pouch young. Since the release of dalgytes in August 2003 there have been seven confirmed sighting of dalgytes throughout the main block of Dryandra (Figure 1). Surveys of areas around the release areas have found significant burrow

and digging activity (Figure 1), which is starting to radiate out from the release sites.

Conclusion

It is too early to say that dalgytes have established within Dryandra Woodland. This latest release is encouraging and a large release of dalgytes may be the best release methodology. However, additional work is required to determine the full extent of their spread and establishment spread throughout the Woodland. Additional funds are required to develop survey techniques as dalgytes will not readily go into standard cage traps.

Reintroduction of the Boodie

On the 19th August 2003 the first phase release of Boodies was undertaken into Dryandra Woodland with the release of seven (five females and two males) boodies into the Soft Release Enclosure (SRE). This was to be followed four weeks later by a hard release of 14 boodies at two separate sites (Figure 2). Within each group, five boodies (three females and two males) were collared so that they can be intensively monitored.

One male (M#33) climbed out of the SRE the first night and established himself in a hollow log within 500m of the SRE. An attempt was made to return him but he again climbed out and he remained within 500m of the SRE for the next week. M#33 was found dead on the 1st September. Necropsy analysis indicated that he had died from a bacterial (Cryptococcus) infection with post mortem scavenging. A typical source of these diseases is pigeons and gallinaceous birds. Veterinary advice indicated that the most likely source of the infection would be from infected feed within the main enclosure. Analysis of fresh feed and contaminated faecal feed fail to isolate the disease within the enclosure. As a result, it is not known how M#33 contracted the disease. This requires further investigation as this has detrimental implications for the other species within the enclosure.

On the 4th September, one of the females (F#20) also climbed out of the SRE. In light of the experience with M#33, it was decided not to return her to the enclosure. Interestingly, 11 days later she had climbed back into the enclosure. Within the SRE, F#24 was found dead on the 11th September. A necropsy report indicated that there was ante mortem predation with signs of puncture wounds around the head and shoulders with significant post mortem scavenging. On the 16th September trapping within the SRE was undertaken to check collar fitness and general condition of the boodies. Surprisingly a sub adult male cat was also captured at the same time. It is likely that this cat was responsible for F#24 predation and analysis of his stomach contents showed that he had recently eaten a woylie.

A hard release of 14 boodies was undertaken on the 16th and 17th September. Site 1 (HRS1) contained artificial burrows built within 10m of an old boodie warren complex that had been resurrected by previously released

dalgytes. Site 2 (HRS2) contained artificial burrows only. The gate to the SRE was opened to coincide with the hard release group release. All groups were provided with food and water. There was no significant difference between the three release groups with the majority of released boodies staying within 1 to 1.5km of their release area. Interestingly, most of the boodies from the SRE made their own way to the HRS1 and occupied the old boodie warren complex. Most boodies that initially moved from the release sites moved back to within 500 to 1000m of the release areas. There was no evidence that any boodie dug their own burrows with the majority occupying either hollow logs, burrows built by dalgytes or sheltering under grass trees.

Two boodies (M#31 and F#34) were found dead on the 30th September and 1ST October respectively. Both of these boodies were occupying the same large hollow log and both were most likely taken by raptors. A second female (F#53) was found dead on the 15th October most likely due to fox predation.

Trapping undertaken on the 14th to the 15th October to monitor condition and reproductive status resulted in the capture of 16 boodies (12 collared and 4 uncollared). Despite some boodies losing weight, all were in good condition; 2 females had small pouch young (most likely conceived since release), 4 females had large young which they had retained with them during their release and one female was lactating, indicating that she had a young in a burrow.

Subsequent monitoring showed that boodies are very susceptible to predation (Figure 3). Despite 1080 baiting at 4 weekly intervals, foxes accounted for the deaths of a further 4 boodies, including one male that survived a fox attack with his collar preventing the fatal bite. He was subsequently taken into care. On average each boodie was taken within 15 days of 1080 baiting, indicating that fox reinvasion into Dryandra is rapid with all boodies taken within 1.4km of the boundary. Raptors were also a significant predator with a further two predation events attributed to Wedge-tail Eagles. This is a bit perplexing as there was no recorded predation event of collared boodies within the main RTD enclosure for the initial 6 months of their release into the southern enclosure in April 1998. Of the remaining fatalities, pythons accounted for two, two were unknown predators (limited evidence indicates fox or cat), one was a possible road kill and one, initially thought to be shot, died as a result of an unknown cause (Table 1).

Table 1: Fate of collared boodies from first release spring 2003

Boodie ID	Date Last Found Alive	Date Found Dead	Cause	1080 Baiting	Days after alive
M#33	28/08/03	01/09/03	Crypto		
F#24	08/09/03	11/09/03	Cat Pred		
M#31	26/09/03	30/09/03	Raptor Pred		
F#34	26/09/03	01/10/03	Raptor Pred		
F#53	10/10/03	15/10/03	Fox Pred	16/09/03	24
F#50	22/10/03	27/10/03	Raptor Ped		
F#28	16/10/03	27/10/03	Unknown Cause		
F#30	10/11/03	13/10/03	Road Kill?		
F#52	10/11/03	13/11/03	Python Pred		
M#53	14/11/03	18/11/03	Fox Pred	13/11/03	1
M#29	24/11/03	27/11/03	Python Pred		
M#38	20/11/03	~20/11/03*	Fox Attack	13/11/03	7
F#20	29/12/03	05/01/04	Fox Pred	09/12/03	20
M#25	27/01/04	04/02/04	Unknown Pred	08/01/04	19
M#27	27/01/04	09/02/04	Fox Pred	08/01/04	19
F#38	27/01/04	09/02/04	Unknown Pred	08/01/04	19
F#54**	06/04/04	10/05/04	Raptor Pred		

* Date approx based on change in behaviour following fox attack. Taken into care on 1/12/03

** Not collared at time of death, fresh intact carcass found on ground.

Despite these setbacks it was decided to undertake an autumn release of boodies to access a more intensive baiting regime around HRS1 and differently constructed artificial burrows at HRS2. An autumn release would also reduce the likelihood of python predation. On the 21st April 2004 fourteen boodies were hard released. Baiting was intensified to include an "infill" of an additional 100 baits around HRS1 every alternative fortnight to the main Dryandra 1080 baiting. Six boodies (2 females and 4 male) were released into the natural burrow complex at HRS1, with two males and two females fitted with collars. Eight boodies (4 females and 4 males) were released into the new artificial burrows at HRS2, with three males and three females fitted with collars.

All boodies released at HRS1 stayed in or around the release site using the established natural burrow. Despite the additional baiting M#36 was taken by a fox within 12 days of his release at HRS1 on the 4th May. The following day efforts were made to recover the remaining boodies at HRS1 to prevent any further predation. F#36 avoided trapping efforts and was taken by a fox that night. F#69 and M#35 were trapped and relocated to a newly discovered natural burrow system east of HRS2 were there had been no recorded fox predation.

Two collared boodies (M#59 and F#59) released at HRS2 were never located after their release. A second collared female (F#55) was never located after the 13th May. The majority of boodies stayed in or around the release site

with most preferentially using hollow logs with occasional use of the new artificial burrows. Raptor predation was a significant factor with the failure of this release site. While two boodies (M#35 and F#36) were both taken by foxes both these animals moved to within close proximity of the boundary before they were taken. As with the earlier releases, all fox predated boodies were taken, on average, within 15 days of fox baiting (Table 2).

Table 2: Fate of collared boodies from second release autumn 2004.

Boodie ID	Date Last Found Alive	Date Found Dead	Cause	1080 Baiting	Days after alive
M#36	03/05/04	04/05/04	Fox Pred	20/04/04	13
F#17	04/05/04	05/05/04	Fox Pred	20/04/04	14
F#69	11/05/04	07/05/04	Raptor Pred		
M#35	19/05/04	21/05/04	Fox Pred	05/05/04	16
F#36	11/05/04	24/05/04	Fox Pred	05/05/04	19
M#39	21/05/04	24/05/04	Raptor Pred		
F#46	21/05/04	24/05/04	Raptor Pred		

Conclusion

Initial results indicate that it is practical to reintroduce boodies into an environment such as Dryandra. All boodies maintained condition with some putting on weight. Females maintained young during their release or conceived once they were released. Dispersal is minimal particularly in comparison to dispersal in other species such as numbats and to boodie dispersal at Heirisson Prong and Faure Island. The lack of burrow construction by the boodies and their reliance on previously constructed burrows require further investigation. However, it would be advisable that any future release of boodies in the South West follow a release of dalgytes. Dalgytes readily dig burrows and this staged release would allow these "environmental engineers" time to construct burrows that can subsequently be used for boodie releases.

The high level of predation, particularly from introduced predators, is of significant concern. This level of predation has conservation implications for other species within the Woodland. It is quite clear from this reintroduction that the current level of "1080" baiting within Dryandra may not be adequate to protect native species within 1.4km of the boundary which has an overall implication for all the reserve. This significant level of predation requires further and urgent investigation.

Figure 1

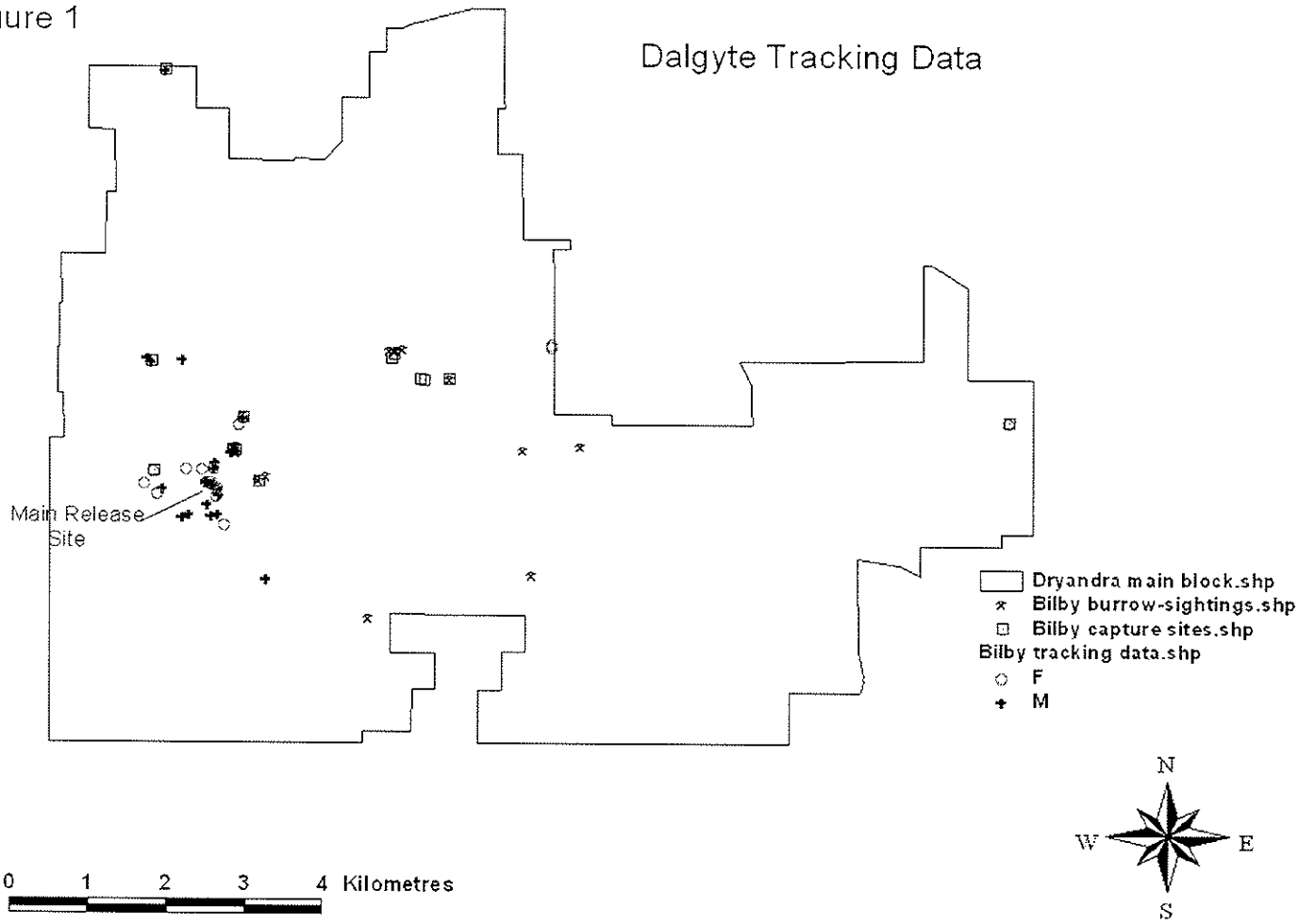
Dalgyte Tracking Data
Main Release Site
Dryandra main block.shp
Bilby burrow-sightings.shp
Bilby capture sites.shp
Bilby tracking data.shp
F
M
N
W
E
S
0
1
2
3
4
Kilometres

Figure 2 - Boodie Fatalities

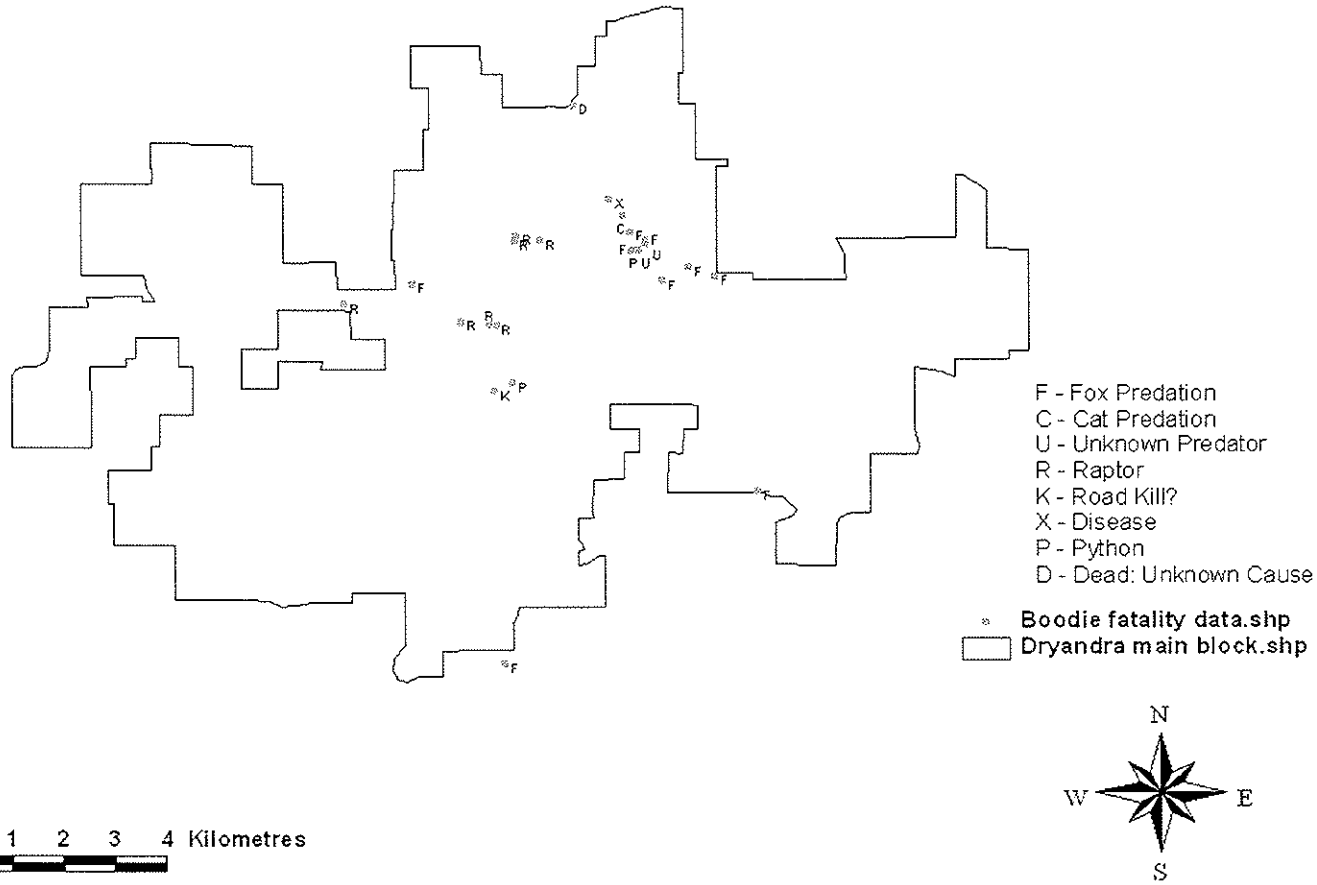

Figure 3 - Boodie Tracking Data