DIBBLER RECOVERY TEAM

ANNUAL REPORT

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by Tony Friend

for

The Dibbler Recovery Team

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SUMMARY

Populations of the Dibbler (*Parantechinus apicalis*) are known from Boullanger and Whitlock Islands in the Jurien Bay area off the west coast, and from the Fitzgerald River National Park on the south coast of WA. A captive-breeding colony of dibblers based on a founder group from the islands has been established at Perth Zoo and breeding protocols have been successfully developed. Introduction of dibblers onto a third island near Jurien through the release of 27 mostly captive-bred animals occurred during 1998 and the fledgling population was monitored during five visits in 1999. The results of monitoring indicate that the release resulted in the establishment of a breeding population there. A second release, of 41 dibblers from Perth Zoo, was carried out in October 1999.

The populations on Boullanger and Whitlock Islands were also monitored during 1999, through trapping as part of a Ph.D. project. Male die-off was observed on Boullanger but not Whitlock Island, the first time this has been seen in the last two years' trapping.

The Fitzgerald River NP population has undergone a dramatic expansion during 1999. The causes of this are unclear, but the most likely explanation is that the more intensive fox control regime introduced in 1997 has been particularly beneficial for this species. The new abundance of dibblers in the FRNP has allowed ecological research that was not possible before to proceed.

The captive-breeding colony, which was based on island animals, is now being switched over to breed mainland animals. This should allow mainland reintroductions proposed under CALM's Western Shield program to proceed.

Funding of the recovery program remains problematic, however. Environment Australia funding ceases in 2000 although the Interim Recovery Plan has a year to run. In the absence of alternative funding, it will be difficult to maintain the momentum achieved in the last five years.

CONTENTS

INTRODUCTION

The rediscovery of the Dibbler by Michael Morcombe in 1967 at Cheyne Beach was only the first step in the long road to securing the species for future generations. This fascinating animal has eluded researchers for years, either in being difficult to find, or difficult to comprehend. The discovery of the Jurien Bay island populations in 1984 by Phil Fuller was another major step forward, because now there was an accessible, abundant population that proved much easier to research than its mainland counterparts.

Dibbler conservation has advanced rapidly since the implementation of the recovery Research Plan in 1995. Collaboration between government agencies, university staff and students and community groups has greatly facilitated this process and has helped spread knowledge of the Dibbler's battle for survival. The Dibbler Recovery Team, established in 1996, has had an essential role in co-ordinating research, management, community awareness and public involvement.

MEMBERSHIP

The membership of the Dibbler Recovery Team as at 1 January 1999 was as follows:

Name	Position	Affiliation
Tony Friend (Chair)	Supervising Scientist, Dibbler Project	CALMScience
Andrew Burbidge	Director, WATSCU	CALM WATSCU
Alan Danks	Leader, Nature Conservation Program	CALM South Coast Region
Keith Hockey	Senior Ranger, Moora District	CALM Midwest Region
Vic Smith	South Coast resident	South Coast community
Jeremy Carter	Jurien resident	Jurien community
Geoff Larmour	TSCS, Dibbler Project Officer	Environment Australia
Helen Robertson	Acting Director of Research	Perth Zoo
Roberta Bencini	Research Student supervisor	University of WA
Pat Woolley	Dibbler expert	La Trobe University
Chris Dickman	Dibbler expert	Sydney University
Tony Start	Corresponding member	CALMScience

During the year, Terry Fletcher was appointed to the position of Director of Research at Perth Zoo and replaced Helen Robertson on the team. CALM received notice from the Threatened Species and Communities Section, Environment Australia, that section staff would no longer be attending recovery team meetings on a regular basis. In addition, staff 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 replaced later in the year by Sarah May.

MEETINGS

Two meetings of the Dibbler Recovery Team were held in 1999. Meeting 8 was held at the WA Wildlife Research Centre, Woodvale, on 24th June and Meeting 9 was held on 2nd December, also at Woodvale.

RECOVERY PLAN STATUS AND FUNDING

Dibbler conservation research was funded by the Australian Nature Conservation Agency (now Environment Australia) and CALM from 1995-1997 through a Recovery Research Project, carried out through CALM's Science and Information Division (now CALMScience). The production of an Interim Recovery Plan (IRP) was one of the contractual obligations in 1997. A funding application was forwarded to Environment Australia early in 1997, before the IRP was written, for new funding in 1998. A detailed budget drawn up and submitted as part of the IRP (Start 1998a) included a student stipend, an item not present in the original application. Although Environment Australia approved funding for the IRP for 1998, no contract was drawn up until March 1999, by which time funding for 1999 had also been approved. Funding for both years was according to the 1997 application, without the student stipend. The contract drawn up in March 1999 related to funding for work in both 1998 and 1999. The first funds for implementation of the Dibbler Interim Recovery Plan were received on 4 May 1999. This included funds for work that was to have been carried out in 1998. The scope items relating to recovery work are as follows:

1998.01 Develop captive husbandry techniques and maintain breeding colony at Perth Zoo. Research into breeding biology of captive and wild dibblers.
1998.02 Locate suitable site for translocation, develop protocols for successful translocation and establish a third island population on a non-house mouse infested island.
1998.03 Research the ecological requirements and monitor dibblers on Whitlock and Boullanger Islands and monitor any translocated populations.
1998.04 Monitor the dibblers in Fitzgerald River National Park and respond to reports of dibblers elsewhere on south coast of WA.
1998.05 Search for mainland dibbler populations on the coast north of Perth.

1999.01 Maintain breeding colony at Perth Zoo. Continue research into breeding biology of captive and wild dibblers.
1999.02 Continue to research the ecological requirements and monitor dibblers on Whitlock and Boullanger Islands
1999.03 Continue to monitor the dibblers in Fitzgerald River National Park and respond to reports of dibblers elsewhere on the south coast of WA.

Funds for this work were not received from Environment Australia until May 1999.

IMPLEMENTATION OF RECOVERY PLAN ACTIONS

5.1 Monitor island and accessible mainland populations

The relevant funded Scope items are 1999.02 and 1999.03.

Since the survey of recorded dibbler sites carried out under the recovery Research Project failed to find dibblers at any mainland site outside the Fitzgerald river NP, this action is currently limited to monitoring the dibbler population within that park and on Boullanger and Whitlock Islands. In future years, the new population on Escape Island will be added to the list of routinely monitored populations as it now appears to have become an established population.

Fitzgerald River NP

Under CALM's program "Western Shield", fauna monitoring by appropriate methods is carried out in selected conservation areas over which routine fox control is being carried out, usually twice per year. Two traplines for monitoring mammal population have been established in the Fitzgerald River National Park (FRNP) , one along the "northern fireline", which runs east from Pabelup Drive in the northwestern section of the park, and one along the Moir Track, at the eastern end of the park. These traplines are known as "Twertup Creek" and "Moir Track" respectively. Both are based on sections of track along which 50 trapsites have been marked at 100m intervals. Both of these traplines have been established in areas where dibblers had been recorded during the 1985/87 biological survey of the FRNP (Chapman and Newbey, 1995).

During monitoring sessions in April and September each year, a cage trap and an Elliott trap are set at each trap site on each trapline. Four nights trapping is carried out at each monitoring session. In addition, on the Twertup Creek trapline, a grid incorporating two pit trap/drift fence combinations and a number of Elliott traps was established near trapsite 41 just prior to the October 1999 trapping session.

In April 1999, one dibbler was captured on the Twertup Creek trapline. Until this year, a single capture or no captures on each trapline comprised the usual pattern. In October, however, 14 individual dibblers were captured at Twertup Creek (including two on the pit-trap grid) and four on Moir Track. The evidence suggests that there has been a large and widespread increase in dibbler numbers within the FRNP. The reason for this dramatic increase is not clear, although it may be related to the fox control regime. Aerial fox baiting was implemented on an experimental basis commencing in 1990-91 on a twice-yearly regime in the western end of the park (Dr. Jack Kinnear, pers. comm.). With the advent of Western Shield, aerial baiting was extended to the whole park in September 1996, and increased to four times a year. It may be that the increase from twice to four times yearly baiting has had a beneficial but slow effect on dibbler populations.

This large increase in dibbler numbers has allowed a research project on the habitat use and spatial organisation of dibblers to proceed (see below).

Boullanger and Whitlock Islands

Monitoring of the island populations is carried out as part of research on the ecology of the island dibblers by honours and Ph.D. students at the University of Western Australia. During 1999, this monitoring was carried out by Harriet Mills , who is completing her Ph.D. on the reproductive biology and genetics of the island dibblers. Results of her monitoring are summarised in the Table 1.

Table 1. Trap success (%) for dibblers during trips to Jurien Bay Islands during 1999.

Date	Boullanger I	Whitlock I
26-28 January	7.4	15.6
14-16 April	4.5	14.2
25-27 May	6.2	16.0
29 Sept – 1 Oct	8.1	26.2
8-10 December	12.2	29.8

Trapping also indicated that there was a die-off of males on Boullanger I. between January and April 1999, but not on Whitlock I. Male die-off has not been observed during the last two years of monitoring, until now.

5.2 Search for new mainland populations

The relevant funded Scope item is 1999.03

During the recovery Research Project, an extensive survey of the sites of previous dibbler records and of a number of sites within the predicted distribution (according to a BIOCLIM analysis) was carried out (Baczocha 1997). Dibblers were found only at the FRNP and on Boullanger and Whitlock Islands.

In the first year of the Interim Recovery Plan, a search for dibblers on the coast north of Perth was undertaken (Scope item 1998.05). A survey of the Lesueur NP was conducted during 1998, but no dibblers were found (Moro, 1999). The search for new populations of dibblers has been scaled down in the current contract with EA to concentrate on responding to reports of dibbler sightings on the south coast of WA (Scope items 1998.04 and 1999.03).

A donation of $1000 by the Paddy Pallin Foundation will fund a search for the dibbler in the Torndirrup National Park near Albany coast during 2000.

No reports of dibblers outside the known areas of occurrence reached the project team during 1999. However during the year the production of a page in a website and other actions to raise public awareness of dibblers (see Actions 7 and 8) have been implemented. One of the likely results of this push to raise awareness is that members of the public who find, or make sightings of dibblers will report their sightings to CALM. These reports will be followed up.

5.3 Research and prevent or control potential threatening processes

Islands

Introduced predators

Frequent visits to the islands by research students provide a high level of vigilance for signs of introduced mammals. No reports of unusual tracks have been made. It is also important that the possible damage caused by the accidental release of pet dogs or cats on the islands is a theme addressed in all public education/awareness exercises.

Fire

The island dibbler populations are apparently very vulnerable to wildfire. The vegetation on the islands is long unburnt, but if the rate of recreational use of the islands increases, the risk of fire also increases. A fire contingency plan exists (Anon 1996) and will be implemented in event of fire. Capture of some animals will be considered.

House mice

The interaction between dibblers and house mice introduced onto the islands is unknown. Application was made in May 1999 for a SPIRT grant (Bencini, Bradshaw and Friend) in 2000 to provide a stipend for a student to study the mouse-dibbler interaction and also the significance of seabird burrows for dibblers on the islands. This grant application was not successful.

Seabirds

Fluctuating numbers of seabirds and collapse of seabird burrows are possible factors affecting dibbler numbers. Research into these possible threats was to have been carried out under the SPIRT grant.

Weeds

Introduced plants do not appear to pose a threat to dibblers but research and management visitors to the islands maintain vigilance against potential problem species.

Human disturbance

See 5.8.

Mainland

Introduced predators

Fox control by distribution of 1080 meat baits continued during 1999 (and is ongoing) in FRNP, Torndirrup and Cape Arid NP, as well as in other coastal conservation areas where dibblers may occur. Cat control is not in operation yet, but the development of a cat baiting regime is far advanced.

Fire

The FRNP Management Plan provides for protection of long-unburnt vegetation from wildfire to provide habitat for a range of species that require such habitat. This may involve the use of fire in strategic areas to provide low fuel buffers.

Twenty-metre wide slashed firebreaks have been constructed around a 20-year-old block within Torndirrup NP during 1999. Much of the eastern section of the park has been burnt by wildfire during the last five years. This block will be surveyed for dibblers during 2000 if sufficient resources are available.

Dieback diseases

Management of CALM conservation areas on the south coast places very high importance on dieback hygiene. Dibblers appear to be dependent on dense scrub and on the south coast some of this vegetation structure is provided by dieback susceptible species. It is vital that the rate of spread of dieback is minimised in these areas.

Human disturbance

See 5.8.

5.4 Establish and maintain captive breeding colonies

The relevant funded Scope item is 1999.01

The dibbler captive breeding colony at Perth Zoo was established in 1997 when two pairs of dibblers from Boullanger I. and two from Whitlock I. were brought into captivity. Breeding protocols were successfully established during the 1998 breeding season and three additional males were brought into captivity from Whitlock Island in November 1998.

During the 1999 breeding season (March-April) seven of the nine females in the program produced a total of 52 young. The management of breeding involved considerable juggling of pairs as females generally rejected the smaller males. There were 4 litters of 8, two litters of 7 and one litter of 6. Two young were subsequently lost from one of the litters of 8, between birth and weaning. Another litter of 8 was lost completely, assumed to have been eaten by the female. The remaining 42 young were raised successfully.

Forty-one dibblers were released on Escape Island near Jurien Bay in October 1999 (see 5.5) following the October 1998 release of 26 dibblers from Perth Zoo. At the Recovery Team meeting on December 2nd, 1999, the decision was made to switch the captive breeding colony from island animals to mainland stock. Harriet Mills' preliminary analysis of genetic variation within and between populations using microsatellites indicates that less variation is present in island than FRNP animals. As the Escape Island introduction appears to have been a success, future translocation projects will involve mainland releases and mainland stock should be used. In addition, mainland dibblers are readily available at the moment from the FRNP and it would be best to take some now rather than at a future time when the population might be smaller. An application for the project team to take up to 12 pairs from the wild at the FRNP to establish a captive colony of mainland dibblers was approved by CALM's Director of Nature Conservation on 6th December 1999. Capture of these animals will be attempted early in 2000, so that quarantine requirements at Perth Zoo can be satisfied before the breeding season

commences in March.

5.5 Use the progeny of the captive colonies to establish a new island population

The relevant funded Scope item is 1999.02.

Monitoring the 1998 release

Escape Island (10.5 ha) was chosen as the site for an introduction of captive-bred dibblers of island stock, in order to provide more security for the species. This particular island was chosen because of its proximity to boat transport, its low intensity of recreational use, its mouse-free status and its populations of burrowing seabirds (assuming that these burrows have some importance to dibblers) as well as its similarity and proximity to the genetic source of the stock to be introduced.

A commitment was made in the translocation proposal (Start 1998b) to carry out monitoring by trapping at least every three months for a year. After that, monitoring would be in accordance with the IRP for all the island populations.

The first release of 26 captive-bred dibblers, eight of which were fitted with radio-collars, was carried out 19 October 1998. The release and monitoring was carried out by Dorian Moro. Monitoring commenced immediately after release. Another monitoring trip (#2) was carried out in December 1998.

The Perth Zoo colony had been managed in 1999 to produce another translocation group for release in late 1999 to reinforce the Escape Island translocation, unless monitoring indicated that animals from the first translocation group had not survived or had not bred.

Four monitoring trips in 1999 were carried out on the following dates and resulted in captures of founders or their progeny from the 1998 release as listed:

	Dates	Males	Females
Trip #3	1-4 February 1999	3	3
Trip #4	19-23 April 1999	1	4
Trip #5	20-26 September 1999	2	5
Trip #6	25-29 October 1999	1	4

The results of monitoring trips #2 - #5 indicated that the first translocation had resulted in a breeding population of dibblers on Escape Island. During trapping between 20-26 September 1999, 7 dibblers (2 male, 5 female) were captured. One of the males was a juvenile, clearly bred on the island. Three of the five females had eight distended teats, indicating that they had bred during the 1999 breeding season. It is unclear whether the other two females had bred and lost their young, or had already weaned them.

Escape Island has a large population of King's skinks (*Egernia kingii*). On the first monitoring trip, all three of the female dibblers captured had lost part of or all of their tails. This is a rare occurrence on Boullanger Island and indicated that the skinks might be responsible for some predation of dibblers. Two of the eight dibblers radio-collared at release

in 1998 had been found dead, but there was no direct evidence that they had been subject to predation. Subsequent monitoring indicated that those animals that had survived the early post-release period had shown good survival subsequently. At the June recovery team meeting the decision was made to proceed with the reinforcement release in October 1999, unless the September trip showed some change in the survival of the first translocation group.

Reinforcement release - October 1999

Forty-one dibblers were available from Perth Zoo for release onto Escape Island in October 1999. They were released in two groups, the second comprising 8 members of a late litter, that were released two weeks later to get them to a higher release weight. The release groups were as follows:

Table 2. Dibblers released on Escape Island in October 1999

Released on 10/10/99			Released on 25/10/99		
Males	Females	Ages	Males	Females	Ages
0	4	2.5 year olds			
4	5	1.5 year olds			
10	10	0.5 year olds	3	5	0.5 year olds

Seventeen of the dibblers released were fitted with radio-collars. Individuals were radio-tracked during the first and third weeks after the first release and trapping was carried out on the 27-29 October, two days after the second release.

Three deaths are known to have occurred in the first three weeks after the first release. None of the carcasses showed signs of predation. One was missing its hind leg, but it is unknown whether this was removed before or after death. Seventeen of the 41 dibblers released were recaptured, and although all had lost some weight, they appeared in good condition. As mentioned earlier, 5 individuals from the 1998 release were also captured.

The results of the monitoring indicate that the Escape Island population has a very good chance of establishment. Predation does not appear to be an important cause of mortality, breeding has occurred and at least 10 young have been recruited into the population.

Another monitoring trip to Escape Island was to be carried out in February 2000.

5.6 Research the genetic and taxonomic status of island vs mainland populations

Harriet Mills' Ph.D. research includes a study of microsatellite variation in dibblers, which will allow measurement of inbreeding levels and of genetic variability within and between

populations. Her preliminary work indicates that although the mainland animal sampled all came from a single site at FRNP, they contain significantly more variation than the island animals. If sufficiently variable markers are found, this technique could allow paternity exclusion to be carried out, to elucidate the dibbler's breeding system.

Dorian Moro has been working with Peter Spencer of Perth Zoo to obtain mitochondrial DNA sequences from dibblers from each island and the mainland. This will allow taxonomic comparison of the various populations. This work has made significant progress in 1999, but it appears that the best sequences are available from liver tissue, rather than ear tissue sampled from live individuals. This limits the number of samples available as it is not possible to take tissue from living animals. Any animals that die during trapping will be sampled, but this is a rare event. Work will continue in the mean time with the small number of samples available.

5.7 Promote public involvement in dibbler conservation and the activities of the Recovery Team

The inclusion of members of the public from Jurien and Albany in the Recovery Team encourages the development of joint initiatives for public participation. It is difficult to include large numbers of volunteers in research and monitoring activities on the Jurien islands due to the fragile nature of the environment, particularly the risk of collapsing seabird burrows. There is scope, however, for small numbers of selected, skilled volunteers to assist in this work.

A large number of volunteers assisted in the radio-tracking exercise at the Twertup Creek site in December 1999. Radio-tracking around the clock from three stations required twelve volunteers continually for two weeks. Volunteers were recruited from Albany and Perth and included people from a wide range of ages and walks of life. This was a very positive experience and raised awareness amongst a broad group of people who will now share the knowledge they have acquired with their friends and colleagues.

5.8 Encourage care and discourage threatening activities through public education and advice to land managers

The Recovery Team forms a vital link between researchers, recovery managers and land managers such as CALM National Parks Rangers. Liaison between researchers and conservation managers allows rapid transfer of information that will result in better management of actual and potential dibbler habitat.

Public awareness through media exposure, volunteer involvement and community membership of the recovery team will also reach managers of land not in the conservation system, and members of the public whose activities may have an impact on dibbler habitat.

Media releases form an important means of reaching a large number of the public. Perth Zoo initiated a media release to coincide with Endangered Species Day in September 1999. The release focused on the success of the recovery program and especially on the role of the captive breeding program at Perth Zoo. This was a very successful release, resulting in several newspaper articles in overseas newspapers and wide coverage in Australia in newspapers and radio news.

5.9 Support post-graduate and other external research relevant to dibbler recovery and, if necessary, appoint a scientist to implement research actions

Support of post-graduate research

During 1999, three postgraduate student projects were assisted financially and with other support by the dibbler recovery program. These projects, through the Department of Animal Science at the University of Western Australia, were all supervised by Roberta Bencini, Lecturer in Animal Science.

- Reproductive biology and genetics of dibblers - Ph.D. project, Harriet Mills
- Dibbler feeding habits and food availability - Grad. Dip. project, Sue Miller
- Spatial requirements and habitat selection of dibblers on Boullanger Island - Honours project, Marina Viviani

Involvement in externally funded research

Applications for external funding were also developed in collaboration between Roberta Bencini (UWA) and Tony Friend (CALM). These were:

- Ecological relationships between an endangered marsupial, the Dibbler (*Parantechinus apicalis*), the house mouse (*Mus domesticus*) and burrowing seabirds. Roberta Bencini, Don Bradshaw and Tony Friend. (ARC/SPIRT).
- Habitat and spatial requirements of an endangered marsupial, the Dibbler (*Parantechinus apicalis*). Roberta Bencini and Tony Friend (ARC Small Grants Scheme).

Tony Friend made a successful application to the Landscope Visacard Conservation Grants Scheme for $3480 to fund a radio-tracking study of the Dibbler in FRNP. This project was carried out in December 1999 and involved the radio-tracking of 11 Dibblers around the clock over a two week period, with the assistance of 21 volunteers. Home ranges are still to be calculated, but the most important finding was that the dibblers were sedentary, in contradiction of the previously held belief that their occupancy of their habitat is often transient. Neither males nor females showed any tendency to change home range location, even over the full trapping period from late October to late January.

Appointment of scientist to implement research actions

Dorian Moro was employed half-time during 1999, principally to carry out the Escape Island translocations and monitoring, but also to work with Peter Spencer of the Marsupial CRC/Perth Zoo to progress the mitochondrial DNA sequencing of dibblers and enable comparison of island and mainland animals.

REPORTS AND PUBLICATIONS

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ACKNOWLEDGMENTS

The strength of the Dibbler Recovery Program lies in its collaborative nature. Many people in a number of organisations give superb support to the recovery actions. In particular, Dorian Moro has made a great contribution over the last two years by single-handedly managing the Escape Island translocations and monitoring, carrying out the Lesueur survey and pushing forward the mitochondrial DNA investigations. Cathy Lambert and other members of the Native Species Breeding Program at Perth Zoo have shown tremendous skill and dedication in developing routine breeding protocols for dibblers. Roberta Bencini and her students, especially Harriet Mills, have made a very significant contribution to dibbler conservation, not only by pushing back the frontiers of knowledge but also by monitoring the island dibbler populations when the full cost of that work could not be funded. Lindsay Brown, Ranger-in-Charge at FRNP gave very valuable support during the radio-tracking project in December. I would like to thank the Recovery Team members, in particular the community members Jeremy Carter and Vic Smith, for giving their own time to advance the cause of the dibbler.

Environment Australia provided $39 000 during 1999 to implement part of the Dibbler Interim Recovery Plan. The Paddy Pallin Foundation provided $1000 to support a search for dibblers on the south coast of Western Australia. The Bankwest Landscope Conservation Visacard fund provided $3480 for a medium-term monitoring program (radio-tracking) for the dibbler in the FRNP. The Marsupial CRC, Perth Zoo and CALM provided vital financial and in-kind support for the program.

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