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INTERIM RECOVERY PLAN NO. 18

DIBBLER, *PARANTECHINUS APICALIS*, INTERIM RECOVERY PLAN

1998-2000

by

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June 1998

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1. BACKGROUND

1.1. History and taxonomic status

Gray described the dibbler, *Parantechinus apicalis* (Marsupialia, Dasyuridae), from a purchased specimen "doubtless from Australasia" (Gray 1842). Ride (1970) states that Gilbert first collected it in 1838 in the vicinity of Moore River near the present town of New Norcia but Gilbert did not visit the Moore River until August 1842 (Whittell 1942). Gilbert also collected dibblers near Wanneroo (just north of Perth) and at "King George's Sound". He recorded Aboriginal names including 'Dib-bler' used at King George Sound and wrote notes for Gould who used them extensively in his text for *The Mammals of Australia* (Gould 1863).

Several other early collectors obtained specimens but recorded little about the animals. Morcombe (1967) provides a summary. Tunney at Gracefield, near Kojonup, took the last (of which Morcombe was unaware) on 3 July 1904. It is in the Dublin Museum (Fisher 1998). Thereafter the dibbler was presumed to have become extinct. However, in 1967 photographer Michael Morcombe caught two in traps set for honey possums on *Banksia attenuata* blooms at Cheyne Beach (= Hassell Beach), east of Albany on the south coast of WA (Morcombe 1967).

Between 1967 and 1995 dibblers were recorded sporadically on the south coast from Torndirrup National Park near Albany (Smith 1990) to Jerdacuttup near Hopetoun (Woolley 1977, 1980). Most locations were within Fitzgerald River National Park (FRNP) (Chapman and Newby 1995). In 1985 dibblers were found on two small islands, Boullanger (25.9 ha) and Whitlock, (about 8 ha) off Jurien, a fishing and holiday town about 200 km north of Perth (Fuller and Burbidge 1987).

In 1995, with support from Environment Australia, implementation of a recovery Research Project was commenced. In the first year, actions concentrated on re-surveying previous locations and searching for new populations. Dibblers were only found in FRNP. In 1996, actions focused on the biology of a population in FRNP. The animals proved difficult to study, but it was concluded the species was relatively secure in the National Park. Western Shield (a program to control feral predators in south western Australia Anon; 1996a, Bailey 1996) and a Management Plan (Moore *et al.* 1991) address the perceived threatening processes. Therefore, in 1997, the last year of the research plan's life, the emphasis moved to the populations on Boullanger and Whitlock Islands where several potential threats were identified (Baczocha and Start 1997).

No subspecies of *Parantechinus apicalis* have been described. However, animals on the islands are substantially smaller than those on the south coast. It has been suggested (but is unlikely) they may warrant recognition as a distinct taxon. A survey of allozymes at 46 loci found no genetic differences between island and mainland forms and no allozyme variation within the Boullanger Island population (Cooper and Birrell 1996). However, low levels of allozyme variation between species have been reported for dasyurids by Baverstock *et al.* (1984). More recent attempts to examine the genetic relationship between island and mainland populations using mtDNA were hampered by technical problems (Cooper and Birrell 1996). Lynam (1987) commented on the genetic relationship of island populations but mainland sites.

Morcombe (1967) recorded his observations of dibblers from Cheyne Beach. He reported they were semi-arboreal with some dependence on large flowers for nectar and insects. They preferred dense stands of *Banksia*-dominated heath with a thick litter layer through which they moved. His specimens, and a later one found by George Duxbury (Muir 1985), all came from long-unburnt vegetation. This led to the assumption that dibblers are restricted to old vegetation and that frequent or extensive fire is a serious threat to their survival. Chapman and Newby (1995) supported the assumption. However Baczocha found a population in relatively young vegetation (approximately 10 years post fire). The significance of the vegetation age in dibbler habitat and the ability of dibblers to use fire edges remain unclear. Nevertheless, most specimens that can be associated with the habitat in which the animals were living have come from thick heath or mallee-heath that was at least 10 years old (or from close by). Most have been found on sandy substrates but animals caught in 1995 and 1996 on Thumb Peak, FRNP, by Sarah Barrett and Natasha Baczocha respectively, were trapped on more shallow, lateritic soils supporting open vegetation (Baczocha and Start 1997).

Dibbler habitat on Boullanger and Whitlock Islands is very different from that on the south coast, particularly in its floristic composition. However, it may have changed considerably since the islands were formed and may not be a useful guide to optimum modern dibbler habitat on the west coast mainland.

Lynam (1987) examined aspects of inbreeding and juvenile dispersal of the island populations. He suggested that reduced genetic variation and developmental instability (indicated by significant morphological asymmetry) were important factors limiting these populations. He ascribed the persistence of dibblers on the islands to an absence of environmental perturbations such as habitat destruction and fire. However, the environment is certainly harsh and has been disturbed by humans and, to a greater extent, by burrowing seabirds. The latter may be important and beneficial as dibblers will live and/or forage in the seabird burrows and the birds import nutrient. Furthermore, there are large populations of *Mus domesticus* and several weed species on the islands. These may have adverse effects. Although dibblers will occasionally eat the mice (Dickman 1986) they are not a common diet item (McCulloch 1998). Weeds have not extensively replaced native plants.

Dickman examined aspects such as population dynamics and the effects of *Mus* removal, reproduction, genetic structure and parasite loads during a three year study of the island populations. Most of his data are as yet unpublished (Dickman personal communication cited in Baczocha and Start 1997).

Woolley (1971, 1991) has examined aspects of their reproductive biology using captive animals. Dibblers breed in autumn (unlike related species which breed in late winter to spring) and produce up to eight young. There is some evidence of promiscuous matings (Dickman 1988). On the islands Dickman and Braithwaite (1992) observed a post-mating male die-off in three consecutive years but this is not always the case (Woolley 1991, Baczocha and Start 1997, McCulloch 1998). Males in a population in FRNP were also able to bred in at least two successive years (Baczocha and Start 1997) and wild-caught animals in Perth Zoo have survived to the onset of a second breeding season in captivity. The life history strategy of dibblers may be quite variable, both between populations and between years within any one population. The breeding biology is the subject of a current PhD research

Interim Recovery Plan (IRP) which will be effective until December 2000. An objective of this IRP is to write a full Recovery Plan by December 2000. Its implementation will be the third phase.

The IRP identifies:
- further knowledge needed for a full Recovery Plan and
- actions necessary to protect the species in the interim.

The Recovery Team that has overseen the implementation of the Research Plan from 1996 and the preparation of this IRP will implement the IRP. The plan and membership of the Team need to be sufficiently flexible to respond to changing circumstances. The Director of Nature Conservation has endorsed the present Recovery Team membership.

Table 1. Membership of the Recovery Team

Organisation	Position
CALMScience	Supervising Scientist, Dibbler Project
CALM WATSCU	Director of WATSCU
CALM South Coast Region	Leader, Nature Conservation Program
CALM Midwest Region	Senior Ranger, Moora District
South Coast Community	South coast resident
Jurien Community	Jurien resident
Environment Australia	TSCS; Dibbler Project Officer
Perth Zoo	Director of Research
University of WA	Research Student supervisor
*Pat Woolley (La Trobe University)	*Corresponding members appointed
*Chris Dickman (University of Sydney)	for their expertise in dibbler biology

1.6.2. Research

The research component offers good opportunities for post-graduate students. This will be encouraged and materially supported where the work is relevant to the implementation of the IRP. One post-graduate research project will be current when the IRP implementation commences in 1998. This is the second year of a PhD project addressing breeding systems of captive and wild dibblers.

A student for a Graduate Diploma of Natural Resource Management (McCulloch 1998) conducted a study of dibbler demography and habitat use on the islands.

Where necessary, a research scientist may also be appointed.

1.6.3. Management actions.

Many management actions that will benefit recovery of dibblers are in place and others are addressed in Section 3.

1.7. AEEC approval

All work involving the handling of live dibblers will be subject to approval by the Animal Experimentation Ethics Committee (AEEC). The CALM, Perth Zoo and University of Western Australia AEECs are properly constituted in accordance with the National Health failure to implement the IRP.

5. RECOVERY ACTIONS

5.1. Monitor island and known, accessible mainland populations

Chris Dickman has intensively studied the populations on Whitlock and Boullanger Islands. Dickman's data have not been published but are available and provide one baseline against which the island populations can be monitored. Under the 1995-97 Research Plan the island populations were monitored in 1995 and 1996 and have been subject to an extensive trapping program through 1997 as part of post-graduate research projects investigating aspects of dibbler demography and habitat use (McCulloch 1998 and Mills[3] unpublished). McCulloch's study suggests population of about 80 dibblers on Whitlock Island and 100 dibblers on Boullanger Island. All animals caught in 1997 have been marked with Trovan passive implanted transponders (PITs).

While student research programs continue, dibblers on both islands will be closely monitored. When research no longer requires regular trips to the islands, they will be monitored at least twice per year by CALM and new animals will be marked with PITs.

Western Shield's monitoring program will involve trapping in several areas where dibblers have been recorded, including FRNP. Any dibbler captures will be reported to the Recovery Team. Additional trapping will be undertaken by CALM at a representative sample of sites where dibblers have been caught since 1990. Unless there are grounds for concern that dibblers may have declined, not all sites in FRNP will be trapped each year. The selection of sites will depend on accessibility, hygiene requirements, and events such as fire. New populations located outside FRNP will be monitored at least annually.

Responsibility:	Recovery Team through CALM
Cost:	Incorporated into Action 5.9
Source:	Environment Australia, CALM, University of WA
Participants:	CALM, University of WA

5.2. Search for new mainland populations

Western Shield's monitoring program will involve trapping in several areas where dibblers may occur, including parts of FRNP where dibblers have not yet been recorded, and Cape Arid National Park. Any dibbler captures will be reported to the Recovery Team.

In Cape Arid National Park there are large areas of habitat with a similar profile to that where dibblers occur in FRNP. Samples of these habitats will be surveyed for dibblers using traps or hair-tubes. Selection of sites will be determined on a reconnaissance trip unless fortuitous observations provide new leads.

There are unconfirmed reports of dibbler sightings on the mainland near Jurien and there are large areas of heath in coastal and adjacent landscapes, which may support dibblers. Samples of these habitats will be surveyed for dibblers using traps or hair-tubes. Selection of sites will

[3] Harriet Mills. PhD student, University of Western Australia.

House mice. The interactions between dibblers and mice are not known. They have co-existed since at least 1985 (Fuller and Burbidge 1987). Decisive competition may occur under extreme stress from events such as drought or fire that have not yet been experienced. Alternatively, mice may induce gradual change over long periods, eg. by preventing recruitment of long-lived plants that are important to dibblers. Plants comprise a significant part of dibbler diets (McCulloch 1998). Interactions and competitive resource requirements will be researched. The recipient island for translocation will be mouse-free (see 5.5).

Seabirds. Dibblers frequently enter seabird burrows for periods ranging from minutes to hours, suggesting they forage and shelter in them (McCulloch 1998). However, their level of dependence on the burrows is not known. There have been suggestions that the number of burrowing seabirds using Boullanger Island has decreased. However a recent inspection found that white-faced storm petrels are abundant. Their small burrows collapse more readily than those of larger wedge-tailed shearwaters. As the latter is the common burrowing seabird on other islands, the suggested decline is probably not true. The use of seabird burrows by dibblers will be researched and the stability of the seabird population will be monitored. If dibblers depend on the burrows for shelter and the seabird population is declining, suitable artificial burrows may provide an alternative.

Weeds. Weeds are not threatening significant changes to the floristic composition or structure of the island vegetation at present. No plants will be knowingly introduced and new invasions will be eradicated if possible. The impact of weeds on island vegetation will be re-assessed if the *status quo* changes.

Human disturbance. See 5.8.

5.3.2. Mainland

Feral Predators. Foxes are controlled under CALM's predator control program, Western Shield, in Cape Arid, Torndirrup and Fitzgerald River National Parks and other areas where dibblers may occur on CALM-managed land. This will be ongoing. Development of methods for broad-area cat control is also supported by CALM. Cats will be controlled where they may threaten dibblers when the technology and necessary resources are available. If new dibbler populations are discovered in areas not covered by Western Shield, feral predator control measures will be initiated if practical.

Fire. The FRNP Management Plan (Moore *et al.* 1991) takes into account the requirement of several threatened fauna species, including dibblers. It provides for protection of long-unburned vegetation. The Plan is in force until 2001, beyond the life of this IRP. However discussion in advance of its revision may occur during the life of this IRP, in which case the Recovery Team will seek input. In areas managed by CALM where there are no current management plans, management generally follows the principle of maintaining the *status quo*, including areas of long-unburned vegetation. Departure from this principal may be approved where managers demonstrate the need for 'Necessary Operations'. The Recovery Team will liaise with managers of other areas where dibblers are found to ensure that unburned areas are retained.

Dieback diseases. The FRNP Management Plan (Moore *et al.* 1991) prescribes measures to prevent the spread of *Phytophthora*. CALM is researching aerial application of phosphite for the control of dieback disease. Experimental areas include sites in the portion of FRNP that

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

When captive-bred young from Boullanger and Whitlock Island stock are available for translocation they will be used to found a new island population. The timing will depend on the availability of animals. Selection of island(s) will be determined by the Recovery Team in consultation with relevant CALM officers and will be subject to approval of a Translocation Proposal in accordance with CALM Policy No. 29

Important factors in selection of suitable islands will include:

- secure tenure controlled by CALM or an agency able to assure long-term management compatible with the presence of dibblers.
- Accessibility.
- Absence of incompatible uses.
- Absence of conservation values that might be compromised by introducing dibblers.
- Availability of resources used by dibblers on Boullanger and/or Whitlock Islands.
- Similarity of habitat to that on Boullanger and/or Whitlock Islands.
- Absence of threats to dibbler survival (which may require pre-introduction management actions, eg. to remove feral predators).
- Absence of house mice.

Captive bred progeny of Boullanger and/or Whitlock Islands and mainland stock will not be released where they may compromise the genetic integrity of wild populations unless there are compelling reasons for doing so.

Responsibility:	Recovery Team through CALM
Cost:	\$61 000 (Year 1) & \$56 000 (years 2-3)
Source:	Environment Australia, CALM
Participants:	CALM, University of WA, Perth Zoo

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

Dr. Peter Spencer, Perth Zoo Geneticist, is researching the genetic difference between the Boullanger Island, Whitlock Island and mainland populations. Study of the young born in the captive-breeding program (Action 5.4) will indicate the influence of environmental conditions on morphometric characters of the three populations. These studies will facilitate a review of their taxonomic status.

Responsibility:	Recovery Team through Perth Zoo and the Marsupial CRC
Cost:	\$2000 (year 1 only)
Source:	Perth Zoo and Marsupial CRC
Participants:	Perth Zoo, Marsupial CRC, University of WA and CALM

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

There are many situations where individuals or community groups can contribute usefully to dibbler recovery. The Recovery Team will encourage and, where resources allow, materially

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