The Dibbler

By A.N. Start

1. What is a dibbler?

The dibbler, *Parantechinus apicalis,* belongs to the family of carnivorous marsupials known as the Dasyuridae. Most dasyurids weigh less than 100 grams. In Western Australia the Pilbara Ningaui, *Ningaui timealeyi,* may weigh as little as 2 grams but a large male Chuditch, *Dasyurus geoffroyi,* can weigh over 2 kilograms. Tasmanian Devils are the modern giants of the family.

Male dibblers weigh up to 100 grams and sometimes a little more but females are smaller, sometimes less than 40 grams. Their appearance is superficially rodent-like but they have more pointed noses. Of course, their anatomy is typical of small marsupials and their dentition is adapted to an invertebrate diet. Dibblers can be distinguished from other similar dasyurids and, in southwest Western Australia, from all other small mammals, by a distinct, pale eye-ring. Each hair has a dark band and pale tip that gives the animals a speckled appearance (they have been called Freckled Antechinus). Their lightly furred tails taper to a point.

Dibblers are not strictly nocturnal. Although they are seldom seen, they are sometimes trapped during the day and the captive dibblers in Perth Zoo often move about in the daytime. They seem to spend a lot of time on the ground where they "swim" through deep leaf litter when it is available but they also climb small trees and visit *Banksia* blooms. They are said to hold their tails in a characteristically upright position when running across open spaces. Most of their food items are insects and other invertebrates but (at least on Boullanger Island) they will occasionally eat mice, birds and lizards. Evidently they like Banksia nectar and, on Boullanger Island they relish ruby saltbush berries in summer.

Dibblers breed seasonally, commencing in their first year. Mating occurs in March or April; gestation is about 45 to 50 days and up to eight young are born about June. At first they remain attached to their mother's nipples but later they are left in a nest until they become independent at about four months old, in spring. Males of many smaller dasyurid species die after mating, leaving a population of adult females and juvenile animals. Chris Dickman recorded a male die-off after the breeding season on the Jurien Islands but observations on the same islands and in Fitzgerald River National Park during in the last three years have shown that many males survive and breed in subsequent years.

No modern biologists have seen wild nests. In the 1840s John Gilbert was told by Aboriginal People living near Moore River that they nest *"in a slight depression of the ground beneath the overhanging leaves of the Xanthorrhoea"* but near Perth, Aboriginals caught them *"in dead stumps or amongst the grasses of Xanthorrhoea"*. At King George's Sound they were said to nest in a raised structure of finer twigs and coarse grass. On the Jurien Islands they often enter shearwater or storm petrel burrows and probably nest in them. On the mainland they may use burrows, but collared animals that have been in one place for sometime during the day, move off

when approached. This suggests they may also sleep above ground, corroborating the information given to Gilbert.

2. Discovering Dibbers.

Gray described the species in 1842 using a specimen he obtained from "*Mr. Brandt of Hambourgh, who purchased it during his late visit to London. Its precise habitat is not known, but it is doubtless from Australasia.*" Up to 1884, various people collected several more. Fortunately, John Gilbert (who was employed by the artist, John Gould, to collect wildlife in Western Australia) obtained several specimens for he was the only nineteenth century naturalist to kept precise locality data or write notes on its natural history. His hand-written notes to Gould (which still exist) provided most of the text accompanying the dibbler plate in Gould's *The Mammals of Australia.* The last of the early collectors to take a dibbler was Tunney. In 1904, he caught one in a hollow log at Gracefield near Kojonup. It is in the Dublin Museum.

3. Rediscovering Dibblers.

The dibbler was not recorded again for 63 years by which time it was assumed to be extinct. But, in 1967, Perth wildlife photographer, Michael Morcombe, set cunningly-designed traps around *Banksia* flowerheads at Cheyne Beach, east of Albany. He hoped to catch and photograph honey possums. Instead, he caught a dibbler. The story (see Further Reading, below) is well worth reading.

More dibblers were caught near Cheyne's Beach in the succeeding months but none have been taken there recently. However, since then dibblers have been found at several locations on the south coast. Dr Vic Smith trapped the western-most dibblers in Torndirrup National Park. A farm cat caught the eastern-most animal near Jerdacuttup, south of Ravensthorpe. Since then dibblers have been caught alive at several sites in the heaths of Fitzgerald River National Park. The first one was found dead on a track; it was probably a cat victim too.

One of the most significant, recent discoveries was dibbler populations on Boullanger and Whitlock Islands, two small islands near Jurien, about 200 km north of Perth. CALM Technical Officer, Phil Fuller found them there in 1985.

4. Dibbler distribution

Since European settlement live dibblers have been collected north of Perth from Wanneroo, two islands near Jurien, sand plains near the Moore River (close to modern day New Norcia). Along the south coast they have been caught between King George's Sound and Torndirrup National Park east to Jerdacuttup and inland to Kojonup. However they are known from sub-fossil remains as far north as Shark Bay and as far east as Israelite Bay in WA as well as the Eyre Peninsula in South Australia. The species may have contracted from the extremities of this range before Europeans arrived. Gould received a specimen said to have come from South Australia but it seems to be lost and the record is doubtful.

It is significant that there are no recent sub-fossil records in the high-rainfall, mostly forested, southwest between Perth and King George's Sound. There are also no records from the more arid country inland of the wheatbelt other than the Shark Bay

specimens and a sub-fossil specimen from Peak Charles (between Esperance and Norseman).

5. The formal conservation status of Dibblers.
The dibbler is classified **'Endangered'** by ANZECC (1991), the Commonwealth *Endangered Species Protection Act*, and the Action Plan for Australasian Marsupials and Monotremes (Maxwell *et al.* 1996). In Western Australia it is declared by the Minister to be **"Fauna that is likely to become extinct or is rare"** under the *Western Australian Wildlife Conservation Act 1950.*

6. Early research.
The collectors of the last century did little more than record (often very imprecisely) the locations from which they obtained specimens although Gilbert was meticulous and recorded information on natural history of all the species he encountered. His manuscript notes to John Gould, his employer, have survived and Gould did little more than edit them for the text of his classic folios on Australian mammals.

7. Recent Research.
In January 1995 CALM began a three year research program that was funded by the (then) Endangered Species Unit of the Australian Nature Conservation Agency (now Environment Australia). The objective was to learn enough about dibblers to write an Interim Recovery Plan and implement it from 1998 onwards. This has been the focus of dibbler work over the past three years. In 1996, a Recovery Team was established to guide the program's priorities and tap the expertise that various people had to offer.

8. Work on south coast
Much of the work in the first year sought to re-survey sites where dibblers had been located since their 1967 re-discovery and to locate new populations. They were found only in the Fitzgerald River National Park (FRNP) although looking for dibblers is like the proverbial needle in the haystack and much of the haystack is still untouched. Nevertheless the second year focused on learning as much as possible about one easily accessible population in the FRNP.

There were many problems, not the least being their mobility (they regularly moved out of range of radio transmitters fitted to collars) and their tendency to abandon sites. At the end of the day, we did not have the ability to closely follow individuals or populations through time and space. Nevertheless we learned a lot about their conservation needs in the FRNP.

9. Management issues on the mainland.
FRNP is clearly a strong hold for dibblers on the south coast. This is a large Biosphere Reserve that contains several other threatened animals as well as one of the world's most diverse floras. Management of the FRNP is in accordance with a Management Plan that recognises the presence of rare species including dibblers. The principal issues are:

- **Fire.** All modern dibbler records are from long un-burnt vegetation (or very close by). The Management Plan recognises this requirement (which is shared by some other threatened species) and prescribes strategies to minimise the chances of wildfire destroying all suitable habitat.

- **Dieback disease.** Pathogenic *Phytophthora* species are already present, but localised, in FRNP. Much of the FRNP's diverse flora is susceptible to *Phytophthora*-caused dieback diseases that can drastically alter its diversity, composition and structure. Although such changes are likely to be detrimental to dibblers, they would be devastating to other conservation values. For this reason there are very strict quarantine rules governing access to and movement in the Park (even dibbler research stops when the soil is wet). While these measures will prevent human spread of the pathogens, natural spread will continue. However CALM is researching the aerial application of phosphonate to contain the disease and FRNP is one of the areas where these experiments are being conducted.
- **Feral predators.** Foxes and cats are present in FRNP. It is highly likely that foxes kill dibblers and cats are known to do so. The Park is aerially baited for foxes under CALM's Western Shield program and CALM has stepped up research into methods for cat control over large areas.
- **Translocation.** Although the establishment of new populations in safe areas has been a useful tool in the recovery of several threatened species, one has to be able to follow the fate of the founder animals to determine the success and, more importantly, to identify and minimise any problems that they encounter. Radio tracking is the best method for cryptic animals like dibblers. However, as mentioned before, we have difficulty maintaining contact with radio-collared dibblers.

In summary dibblers seem to be widespread, if patchy, in FRNP where all that can be done is being done to maintain their habitat and minimise threats. CALM will continue to monitor dibblers in FRNP and will be trapping in other areas of the south coast where dibblers may persist as part of Western Shield. As developing technology improves our ability to manage dibblers, it will be applied.

10. Management issues on the Jurien islands.

The two populations on small islands off Jurien are adapted to a very different climate and habitat to those on the south coast. It is thus important that their genetic strain is maintained for the future recovery of dibblers and to improve their capacity to deal with climate change. There are several factors that need attention by managers. These are:

- The populations, being restricted to two small islands, are small (perhaps a hundred animals on each island) and very vulnerable to disasters.
- The dibblers use seabird burrows for foraging, shelter and perhaps for nest sites. Reduction in the number of seabirds breeding on the islands might affect dibblers.
- House mice have been introduced to both islands. Dibblers will sometimes feed on the mice but we do not yet know whether mice are competing for resources that dibblers require. If the latter is the case, the "crunch" might come in a particularly hard year (eg. in times of drought or after a fire).
- There are not yet any feral predators on the islands, but they are popular places close to a holiday town so there is a risk of cats, in particular, getting there.
- Fortunately there are few aggressively invasive weeds on the islands, the alkaline soils are not conducive to *Phytophthora* and the salty, coastal vegetation is less fire-prone than many. Nevertheless these are potential threats that need careful assessment and contingency plans.

11. Captive Breeding and Translocation. A captive colony offers several benefits including:

- Development of husbandry techniques for dibblers in case we have to resort to captive breeding of mainland populations or rescue animals from the islands following a disaster (eg. fire)
- Insurance against disasters wiping out the wild populations before dibblers can be salvaged
- Stock for introduction to new sites (eg a mouse-free island)
- Opportunity to study the reproductive biology of dibblers.

Four pairs, two from each island, were brought to Perth Zoo in 1997. Three females gave birth to twenty one young, of which nineteen were raised. One female died. The 1998 the breeding program was also successful and in October this year twenty eight dibblers were released onto Escape Island.

Their new home is also near Jurien. The habitat is very like that on Whitlock Island but Escape Island has twice the area of Whitlock. Rocky shorelines and shallow water make it much more difficult to land on and, anyway there are no nice beaches like those on Boullanger Island, so it is less prone to visitors (and their abandoned cats, dogs or fires). It has lots of shearwater burrows but no house mice on it.

12. Recovery Team Commitment

The success of this project has been due to the involvement of many people. Representation on the Recovery Team is indicative of the diversity of skills that people and organisations have been willing to contribute. It involves:

- CALM Scientists and managers,
- Community members from Jurien and the south coast
- Perth Zoo (and the Marsupial CRC) scientists and keepers
- University of WA post graduate students and their supervisor
- Corresponding members who have researched dibblers in the past at La Trobe University and University of Sydney
- Consultant zoologists
- Environment Australia

The Recovery Team has written an Interim Recovery Plan that is now the basis for the projects next three years. One of the Objectives in the IRP is preparation of a full Recovery Plan to take its place thereafter.

13. Further reading.[1]

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[1] The bibliographies in these references will lead interested students to further publications. Tony Start or Tony Friend, both at CALM's Wildlife Research Centre, Woodvale, will help any student who can not access any of these documents.

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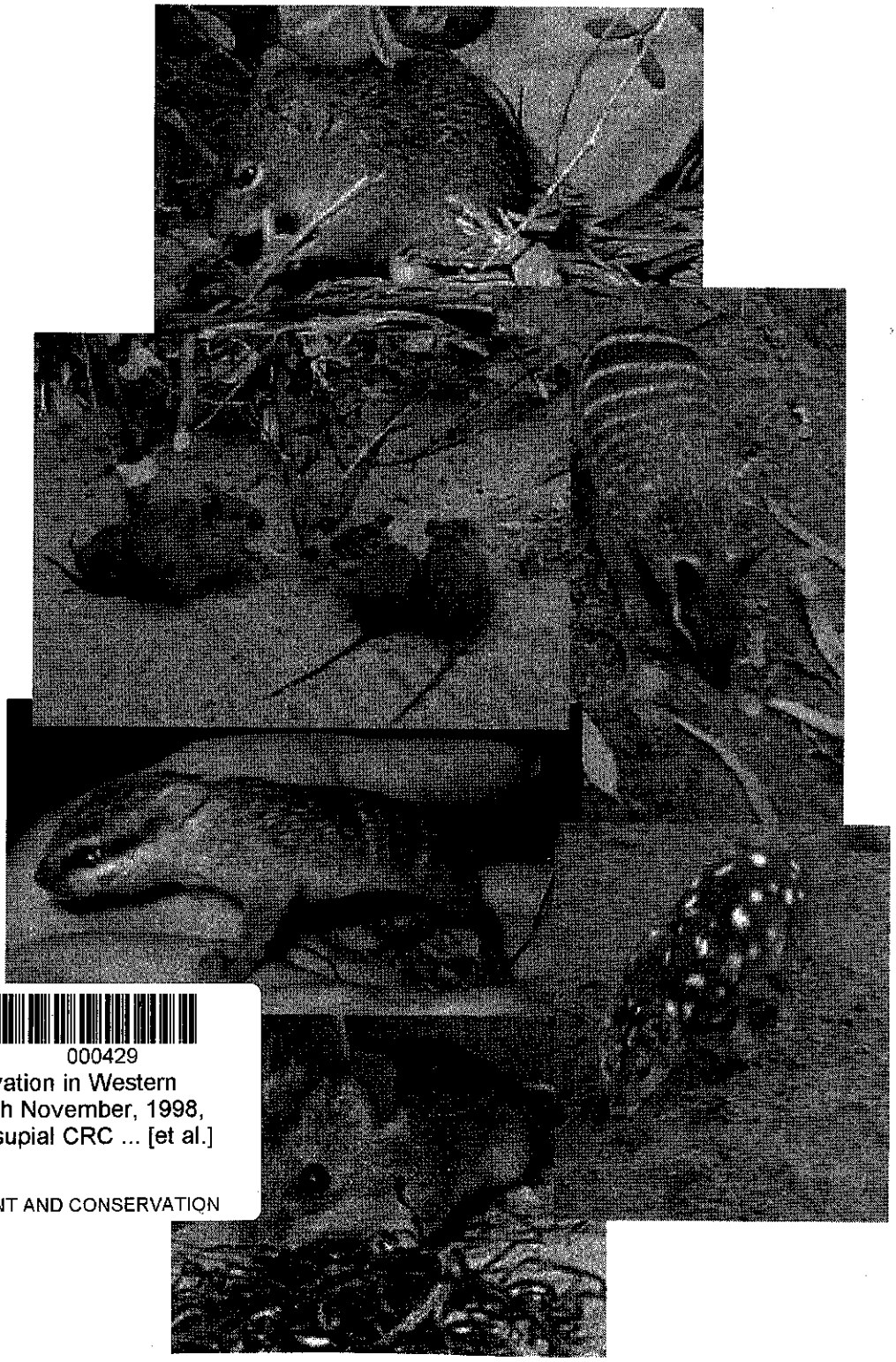

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