The Dibbler

Presented by

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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 male chuditch, *Dasyurus geoffroyi,* can weigh over 2 kilograms. Thylacines and Tasmanian Devils are the modern giants of the family although there were even larger species in the long extinct mega-fauna.

Male dibblers can 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 south west Western Australia, from all other small mammals, by a pale eye-ring. Each hair has a dark band and pale tip which gives the animals a speckled appearance (they have been called Freckled Antechinus).

There is still much to be learned about the natural history of dibblers. However they are very difficult to study because, on the mainland, they are often hard to trap and their day to day movements take them beyond the range of radio collars small enough for them to wear. Even in the day time, collared dibblers will move off while an observer is up to 100 metres away. One tagged animal moved 600 metres between traps in half an hour. Dibblers can often be trapped at any one site for a year or two, but then they disappear. Have they moved on? have they died out? Or have they become trap-shy?

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 (for nectar or insects ?). 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 eat mice and birds.

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 two years have shown that males can survive and breed in subsequent years.

No modern biologists have seen wild nests. 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" while 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 use seabird burrows but we do not know how much they depend on them or use them for nest sites. On the mainland recent observations suggest that they use burrows sometimes, but the fact that collared animals, which have been in one place for sometime during the day, move off when approached, suggests they may also rest above ground, corroborating the information given to Gilbert.

2. The discovery of Dibbers.

Although John Gilbert collected a dibbler at Moore River (somewhere near New Norcia) for Gould in 1838, Gray described the species in 1842 using 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." Several more were collected by various people up to 1884. Fortunately ,Gilbert obtained several specimens for only he kept precise locality data and wrote 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.*

3. The rediscovery of Dibblers.

For 83 years the dibbler was not recorded again and it was assumed to have become 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 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 dibblers have been found at several locations on the south coast since then The western-most was trapped by Dr Vic Smith in Torndirrup National Park and the eastern-most, near Jerdacuttup, was brought in by a cat. The first record from Fitzgerald River National Park was an animal found dead on a track. Since then dibblers have been caught alive at several sites in the heaths of the northern part of this park. Recently one was trapped on Thumb Peak.

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. The discovery was made by Phil Fuller and Andrew Burbidge in 1985.

5. Its range

Since European settlement live dibblers have been collected north of Perth from Wanneroo, two islands near Jurien, sand plains near the Moore River near 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, south-west between Perth and King George's Sound. There are also no records from the arid zone inland of the wheatbelt other than the Shark Bay specimens and a sub-fossil specimen from Peak Charles (between Esperance and Norseman).

6. The formal status of the Dibbler.

The dibbler is Classified Endangered in The 1996 *Action Plan for Australian Marsupials and Monotremes* and it is declared by the Western Australian Minister for the Environment to be fauna that 'is likely to become extinct, or is rare'.

7. 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 noted 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.

8. 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 (ANCA). The objective was to learn enough about dibblers to write a 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.

9. 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 hay stack and much of the hay stack is still untouched. Nevertheless the second year focused on learning as much as possible about one easily accessible population in the FRNP.

Some of the problems have been mentioned already (eg. radio-tracking and trapping). At the end of the day it had to be accepted that we did not have the ability to readily detect dibblers or to closely follow individuals through time and space. Nevertheless we learned a lot about their conservation needs in the FRNP and concluded that for the time being the issues facing the island populations were more critical. The focus is now on these island populations. However that is not to say that mainland dibblers will be forgotten.

10. Management issues on the mainland.

FRNP is clearly a strong hold for dibblers on the south coast. This is a large Biosphere Reserve which 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 which recognises the presence of rare species including dibblers. The principal issues pertaining to dibblers in FRNP 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 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 which 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.

- **Predation by 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 do not have the technology to maintain contact with dibblers all the time.

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 technology develops it will be applied to dibbler research and management.

11. 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 for the future recovery of dibblers and maintenance of their capacity to deal with climate change, if for no other reasons, that their genetic strain is maintained. There are several factors that need attention by managers. These are:

- The populations, being restricted to two small islands, are small (perhaps a few hundred animals at most) and very vulnerable to disasters.

- The dibblers use seabird burrows for 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 can sustain them or 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 weeds on the islands, the alkaline soils are not conducive to *Phytophthora* and the salty, coastal vegetation type is less fire-prone than many. Nevertheless these are potential threats that need careful assessment and contingency plans.

12. Present actions.

Captive Breeding. 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 earlier this year (1997). Three females gave birth to twenty one offspring. Nineteen survived and are growing well. They will soon be weaned. The female that did not breed has since died. This Recovery Team program involves the Marsupial CRC, Perth Zoo, CALM and the University of WA where PhD student, Harriet Mills is studying the reproductive biology of the captive and wild populations.

University of WA student Callum McCulloch is studying several aspects of the ecology of dibblers on the islands. His work will provide important knowledge for a Recovery Plan for these populations. An interim Recovery Plan will be written by the end of this year.

CALM, through the Western Shield program, will continue to monitor dibblers in FRNP. Where necessary additional time will be allocated specifically to dibbler monitoring. Further, the Friends of FRNP have obtained funds to promote dibblers (a dibbler will used for the Biosphere Reserve logo) and plan to continue survey work.

13. Further reading.[1]

Baczocha, N. and Start, A.N. 1996. Status and ecology of the dibbler (*Parantechinus apicalis*) in Western Australia.. 1996 Annual Report. Department of Conservation and Land Management. Perth.[2]

Fuller, P.J. and Burbidge, A.A. 1987. Discovery of the Dibbler *Antechinus apicalis* on islands at Jurien Bay. *The Western Australian Naturalist.* **16:** 177-181

Gould, J. 1863. *The Mammals of Australia.* Vol I. republished as Gould, J. 1976. *The Marsupicls and Monotremes of Australia* with additional text by Joan M. Dixon. Macmillan, Melbourne & Sydney.

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[1] The bibliographies in these references will lead interested students to further publications.

[2] This is an unpublished report but copies can be borrowed from A.N. Start, CALM Wildlife Research Centre, P.O. Box 51, Wanneroo, WA 6065. *Tel.* (08) 9405 5100

Maxwell, S., Burbidge, A.A. and Morris, K.D. (Editors) (1996). *The 1996 Action Plan for Australian Marsupials and Monotremes*. Wildlife Australia, Endangered Species Project Number 500. Environment Australia, Canberra.

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Woolley, P.A.. 1991. Reproductive Pattern of Captive Boullanger Island Dibblers, *Parantechinus apicalis* (Marsupialia : Dasyuridae). *Wildlife Research* **18:** 157-163.