BANKWEST LANDSCOPE CONSERVATION VISACARD

Medium-term radio-tracking of dibblers, Fitzgerald River NP

Final report

, CALMScience, Albany

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Introduction

Since the rediscovery of the dibbler near Cheyne Beach in 1967, specimens have been recovered from several sites along the south coast between Albany and Jerdacuttup. No detailed studies of the biology of the dibbler on the mainland had been carried out, however, until the work of Natasha Baczocha in the Fitzgerald River NP in 1995-97 (Baczocha and Start 1997).

Radio tracking offers the ability to document animal movements, and therefore to elucidate habitat use, magnitude and pattern of dispersal, spatial organization and short-term interactions, as well as tracing activity patterns. Predation events are likely to be revealed. Through its ability to provide detailed information about the mode of life of individuals, radio-tracking can allow a close understanding of an endangered species' biology. This information is of vital importance in designing habitat management regimes to assist the recovery of these species.

Baczocha's study included some radio-tracking but this work was hampered by the short range of the transmitters used (70 metres Baczocha and Start 1997). Results of trapping dibblers in the FRNP gave the impression that dibblers sometimes move large distances. Dibbler numbers in the FRNP have risen since that study and developments in miniature transmitters, batteries and tag materials have allowed better performance to be gained within a suitably small, light package.

During 25-29 October 1999, one of the twice-yearly Western Shield trapping sessions was conducted on the Twertup Creek trapline, situated on 5 km of the "northern fireline" (a firebreak along the former northern boundary of the FRNP) between Twertup Creek and the Jacup South Road. During this period 13 individual dibblers were captured, in a total of 20 dibbler captures. This represented a dramatic increase over the usual tally of zero or one dibbler capture per session previously recorded on this trapline.

Aims

The aim of the project was to use radio-tracking to enable a more detailed understanding of the movements and social organization of dibblers in the Fitzgerald River National Park.

A specific objective was to determine whether dibblers occupy the same sites for significant periods of time, that is, whether they establish home ranges or whether their occupation of suitable habitat is transient. This was to have been achieved by radio-tagging dibblers then locating them at intervals during the life of the tags, using an aircraft if need be. However, as explained below, the tags lost their aerials and could only be detected by an aircraft directly overhead. This necessitated the use of ground-based tracking to locate dibblers at all times.

Methods

Collar tags suitable for dibblers were developed through consultation with Biotrack (UK). High-performance transmitters were teamed with lightweight collars incorporating woven Teflon over a light gauge brass strip and a very thin NiTi whip antenna. Tests showed that the package had a signal reception range of about 500 metres ground-to-ground. A collar was fitted to a dibbler in Perth Zoo, in order to check its suitability for dibblers. After two months, no ill effects were suffered either by the dibbler or by the collar.

In the initial application, the approach proposed was to trap and radio-collar dibblers and then to locate them on the ground at regular intervals during the life of the tags (10 weeks). If possible, animals that disappeared from the area would be relocated by the use of a light aircraft equipped with radio-tracking aerials. A test transmitter was located readily with an aircraft. When dibblers were radio-tagged then radio-tracked over two weeks from mast-mounted antenna arrays, however, signals became increasingly difficult to pick up. An aircraft flown over the site could only locate tags immediately below it. On recapture of some animals, it was discovered that most of the whips had broken off the collars, greatly diminishing signal range.

The emphasis of the project then became the study of spatial organization through intensive radio-tracking of dibblers occupying a localised area. Further development of radio-tags will be necessary in order to study longer-term movements. The opportunity was taken to use trapping in conjunction with radio-tracking to determine whether dibblers not recaptured had indeed left the area.

The time scale of the investigation was determined by the life of collars suitable for dibblers. The two-gram collar tags developed had a life of 10 weeks. During an initial trapping period (nights of 7-9 December 1999), dibblers in a localised area were tagged and released. Between 10th and 20th December 1999, these animals were tracked round the clock from three stations by teams of volunteers operating six-hour shifts. Tracking was suspended for two days during this period (2100 on 12/12/99 to 0900 on 15/12/99) when heavy rain prevented access to the study area. On 19th December 1999, an aircraft was used to locate dibblers in the study area.

Dibblers were located on the ground on 17 January 2000 and the trapping grid was reactivated from 17-22 January 2000. Collars were removed from live dibblers and collars found lying on the ground were retrieved. Trapping was also carried out on the same grids from 7-10 April 2000 and at the trackside trapsites from 2-5 May 2000.

Fieldwork completed

24-29 October 1999	Initial trapping survey
7-10 November 1999	Broadscale survey of habitat types
7-20 December 1999	Intensive trapping, radio-tagging and radio-tracking with volunteers
17-22 January 2000	Follow-up radio-tracking/trapping
7-10 April 2000	Follow-up radio-tracking/trapping
2-5 May 2000	Trapping to remove collars

Dibblers tagged

Animal ID	Sex	Weight	Age	N/R/RT	Collar
				Dec 1999	January 2000
2	F	47	SA	R	Not found
6	F	78	A	N	Whip gone
7	F	75	A	N	Whip gone
8	F	45	SA	N	Whip gone
9	F	57	SA	N	Whip present
10	F	76	A	N	Whip gone
1	M	78	SA	R	Whip gone
4	M	67	SA	R	Whip gone
6	M	120	A	N	Not found
7	M	105	A	N	Whip gone
8	M	93	A	N	Whip gone

Major findings

- The study area supported a high density of dibblers. Trapping in December 1999 and January 2000 resulted in the capture of 20 dibblers on a trapping grid covering approximately 75 hectares. This total included 10 males (5 adults, 5 subadults) and 10 females (3 adults, 7 subadults). Clearly a complete male die-off did not occur in 1999.

- Individual dibblers occupied discrete home ranges. The Figure shows the plotted positions of 11 dibblers over two days of tracking (aerial photos flown on 19 October 1997). All dibblers remained within the study area for the entire two-week tracking period.

- Dibblers had very restricted crepuscular activity periods during the tracking period (10-20 December), extending from approximately 5.30 am-7.30 am and from 4.30 pm-8.30pm.

- Although dibblers were tracked to their diurnal and nocturnal rest sites after the tracking period, no nests were found. None of the dibblers were found in burrows. Most dibblers moved away when their rest site was approached. One dibbler remained under thick vegetation when approached and may have been occupying a surface nest. It moved around within a $5m^2$ area within the scrub but did not leave its shelter.

- Dibblers have a low recapture probability. A high proportion of radio-tagged dibblers were not captured during subsequent trapping although they were located close to available traps.

- Dibblers occupied the long-unburnt vegetation on the south-eastern side of the track and avoided the 5-year-old vegetation on the north-western side.

Conclusions

This study demonstrated that radio-tracking, especially in conjunction with trapping, can be used to elucidate many details of the dibbler's biology. A dense population of dibblers can exist within an area. More focussed radio-monitoring will enable the process of dispersal to be traced and determine causes of mortality. Transmitters need to be fitted with more robust whips to last 2+ months on dibblers. As firebreaks cannot be used for access during wet soil conditions, it is very difficult to continue fieldwork at this site through winter. Efforts are being made to locate a potential study population on an all-weather road in the FRNP.

Costs

The proportion of the budget for the project as originally proposed was $3480, consisting entirely of aircraft hire time. As described above, searching for tagged dibblers by plane was shown to be impractical and the emphasis of the project shifted to detailed radio-tracking at a site, with labour provided by a large number of volunteers. The costs directly generated by this project are listed below. All plant costs, including trips before and after the tracking period are shown, but equipment purchases, including transmitters, extra receivers, two-way radios and shelters, are not presented.

Costs		$
Volunteer food	15 persons, 14 days	1570.38
Camping allowance	JAF and GLM	1490.92
Accommodation	Friends of FRNP	200.00
Plant costs	2 vehicles	6683.14
Aircraft time	2 hours plus ferrying	415.00
TOTAL		**10359.44**

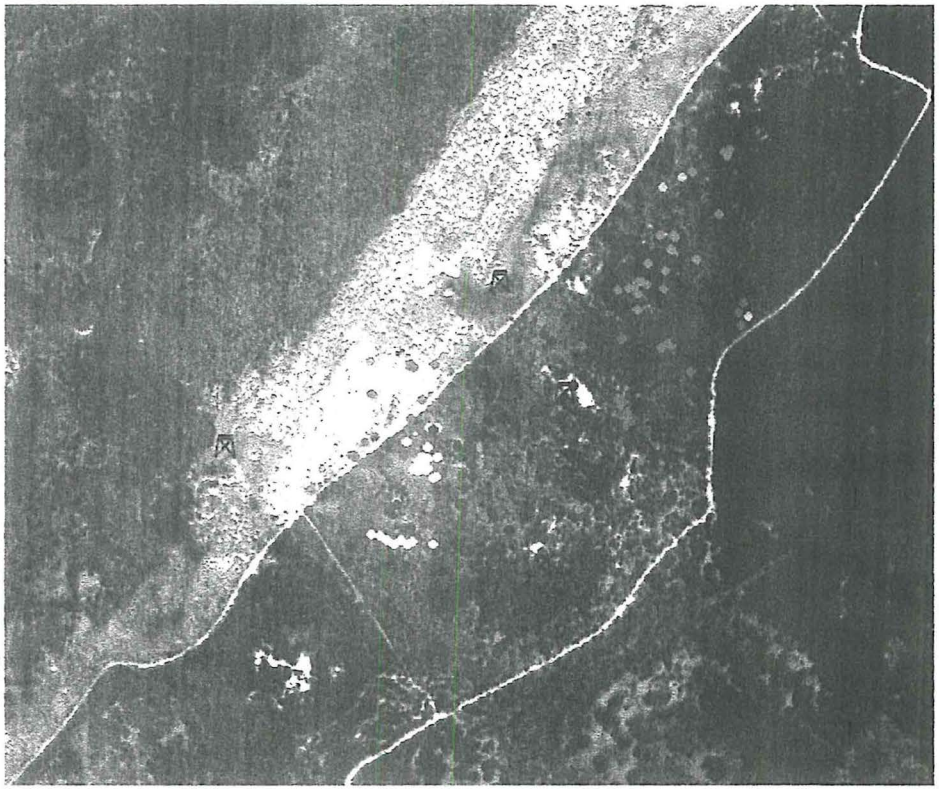
Acknowledgments

Many people contributed to the success of this project. I would like to thank particularly Geoff and Catherine Lipsett-Moore, for their unfailing support in the field, catering and managing logistics during December 1999. The many volunteers were the backbone of the project and I thank them all for their hard work and good humour.

Reference

Baczocha, N. and Start, T. (1997). Status and ecology of the Dibbler (*Parantechinus apicalis*) in Western Australia. 1996 Annual report. Unpublished report for Environment Australia. Department of Conservation and Land Management, Western Australia.

FRNP Dibblers - December 1999



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Male 6
Male 7
Male 8
Female 2
Female 6
Female 7
Female 8
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Female 10

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