

RADIO TELEMETRY OF RED-BROWED FINCH *Neochmia temporalis* AT NEWCASTLE, NEW SOUTH WALES

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Radio telemetry is a relatively widely used technique to track the movements of birds. To date, however, the technique has been largely restricted to studies of larger birds with the weight of transmitters being the limiting factor. Kenward (1987) suggested that the transmitter not exceed 3 per cent of the total body weight. However, studies of some Australian birds have used packages of almost 10% without any obvious problems (Table 1).

As part of a study of the ecology of the Red-browed Finch *Neochmia temporalis* in urban areas, three finches were fitted with radio transmitters to obtain information on the movements of individual birds within Blackbutt Reserve, Newcastle (32°E56.5'S, 151°E42.5'S). The Blackbutt Reserve is owned by the Newcastle City Council and has a number of picnic areas and public exhibits (aviaries and cages) on display within its boundaries. The finches had access to freely available artificial seed supplies either within aviaries with large wire mesh that were entered easily, or as feed for domesticated geese. The 182 ha reserve was largely isolated from other tracts of bushland by urban development.

The transmitters used were single stage radio transmitters ('379' size) with 2 volt lithium batteries manufactured by Titley Electronics. The batteries had an approximate lifespan of a few days. The entire package weighed approximately 0.7 grams, about 7 per cent of the bird's body weight. The transmitter was attached to feather shafts on the lower back with a commercial veterinary glue, Vetbond. The transmitter was aligned along the body axis of the bird so that the whip aerial projected beyond the tail by approximately 10 centimetres. The receiver used to track the birds was a Regal 2001 Receiver using a Yagi antennae.

Three radio tagged birds were initially captured near public exhibit aviaries. During approximately 40 hours of tracking over four days the radio tagged birds were not located more than 400 m from their initial point of capture. One of the radio transmitters was found to give off an extremely weak signal once the bird was released and was subsequently not located again. A second bird also had a weak signal and was located on three occasions and only on the day of capture. The third transmitter gave off a far stronger signal and was located into the fourth day after capture, with a total of 52 point locations identified. Both of these latter birds were found to be part of a flock of about 50 Red-browed Finches. This flock was already known to roost in thick forest undergrowth within 30 m of an artificial dam across the main creek in the most southerly, moist gully in the Blackbutt Reserve. Most of the birds' time was spent in the vicinity of the dam, feeding on seed provided for domestic geese, although a few trips were taken to the aviaries on each day (Table 2). On only three occasions was a radio tagged finch (bird number 50201) located away from either the dam or the aviaries and on all of these occasions the bird was still within 150 m of the dam. A far more extensive colour-banding program (Todd 1995) found that this population of Red-browed Finches displayed a high degree of sedentary behaviour as suggested by the radio tracking study.

These radio transmitters (when operating properly) were found to be adequate to track the birds only because local knowledge was used to assist in the location of the birds when radio signals were too weak to be of direct benefit. Signals could be detected at distances of up to 50 m but this was affected by dense vegetation. If the birds had not proved to be resident it would have proved rather more difficult to track them.

TABLE 1
Some radio telemetry studies of Australian birds.

Species	Weight (grams)	Source	Relative Transmitter Weight
New Holland Honeyeater <i>Phylidonyris novaehollandiae</i>	~17	O'Connor <i>et al.</i> 1987	~10%
White-cheeked Honeyeater <i>Phylidonyris nigra</i>	~17	O'Connor <i>et al.</i> 1987	~10%
Helmeted Honeyeater <i>Lichenostomus melanops cassidix</i>	17-27	Runciman <i>et al.</i> 1995	4.5%-8%
Ground Parrot <i>Pezoporus wallicus</i>	~73	Jordan 1988	
Gouldian Finch <i>Erythrura gouldiae</i>	14	Woinarski and Tidemann 1992	~6%

TABLE 2
Results from radio tagged Red-browed Finches at the Blackbutt Reserve.

Band Number	50201	50187	43140
Signal Frequency	151.576 Mhz	151.615 Mhz	—
Time between First and Last Record (hours)	74	7	—
Number of Point Locations Detected	52	3	—
% of time at Dam	61.9%	33.3%	—
% of time at Aviaries	23.8%	66.6%	—

Improvements will need to be made to the technology before radiotracking will be an effective method in the study of small passerines, such as grassfinches, in densely vegetated environments.

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