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## SOME RESULTS FROM A LONG-TERM BIRD-BANDING PROJECT IN THE BRINDABELLA RANGE, A.C.T.

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During a 19-year study of birds in the Brindabella Range, A.C.T., about 35 000 banding records, comprising both captures and recaptures, were obtained for 52 species. Individuals from 16 species were never recaptured but more than 1 000 capture and recapture records were obtained for four species. About 12 species appear to be seasonal altitudinal migrants.

### INTRODUCTION

In 1961 a bird-banding study was commenced at New Chums Road (35°24'S., 148°50'E.), in the Brindabella Range, A.C.T., by S. J. Wilson, in conjunction with a visual bird survey by D. W. Lamm. While the visual survey has been discontinued the bird-banding study is continuing.

The Brindabella Range is situated to the west of Canberra and runs more or less north-south with an altitude of between 1 300 and 1 900 m along the ridge. To the east it slopes down to 500 m over a distance of about 12 km (in a straight line). New Chums Road runs along the eastern side, extending for about 3 km and roughly following the 1 050 m contour line through mainly

wet sclerophyll forest, although it passes through dry sclerophyll forest on the exposed ridges.

An initial account of the study (Lamm and Wilson 1966) recorded 35 species of birds from the site. Horey and Wilson (1971) summarized results of over 8 000 captures and recaptures for the period 1961 to 1971, and presented tables of annual captures for 48 species. Stokes (1975) described the changes in number of Flame Robins captured before and after a bush fire which burned about half of the net sites in 1972. This paper presents data on the species captured at New Chums Road from 1961 to 1979 inclusive, and serves as an introduction to further papers on this study, one of the longest-running, continuous banding studies by amateur ornithologists in the southern hemisphere.

## METHODS

Mist-nets were set at fixed sites along about 2 km of New Chums Road. The aim was to make monthly trips to the site and to set a minimum of 20 nets although fewer were erected in the early part of the study (see Horey and Wilson [1971] for details). All birds which were caught were banded with bands supplied by the Australian Bird-banding Scheme (ABBS), CSIRO Division of Wildlife and Rangelands Research. Data relating to age, sex and plumage were recorded for each bird. Moulting details and mass were also taken, but not on all occasions. The nets were usually opened by first light and remained open until at least midday, sometimes later. Nets used were either 12.2 m × 2.7 m or 18.3 m × 2.7 m and were opened to an effective height of 1.8 m. Capture data have been standardized by expressing results in numbers per net-area-hour. Net area hours were calculated using the effective height multiplied by the length of the net and the time in hours it was open.

Data were submitted to the ABBS and later, together with records from other locations in the Brindabella Range, transcribed for computer analysis. Capture-recapture information from Lee's Creek Road (35°22'S., 148°50'E.), 3 km away, and Blundell's Creek Road (35°21'S., 148°50'E.), 4 km away which are about 740 m lower than New Chums Road, were compared with that from New Chums Road to determine whether there was any evidence of altitudinal or seasonal movements by any species. Data from three other nearby locations are included in the data base: Lower Lee's Creek Road (35°21'S., 148°51'E.), 3 km away, Bushranger's Creek Road (35°24'S., 148°49'E.), 3 km away, Lee's Springs (35°22'S., 148°48'E.), 4 km away, and Bull's Head Creek Road (35°22'S., 148°49'E.), 2 km away. The total number of trips per year to these locations varied from six to 22 (average 13.6). Data from these sites are not as complete as from New Chums Road.

## RESULTS

About 35 000 banding and recapture records were obtained, nearly half coming from New Chums Road (Table 1: captures 10 540; recaptures 4 597) and the remainder from other loca-

tions in the Brindabella Ranges. Because of shorter day-length and fewer trips, the number of net-area-hours for winter was about half that for the summer (Table 1).

Individuals from 52 species were banded at New Chums Road (scientific names of species in text are given in Table 1): of these, individuals from 16 species have been banded but never recaptured (Table 2a) and together with another three species contributed fewer than 10 records each (Table 2b). In contrast, there are more than 1 000 banding and recapture records for each of four species (Table 2c), although this includes instances of individuals being retrapped more than once (Table 1).

Considering those species with a minimum of 40 records, the occurrence of at least 12 species decline markedly at New Chums Road during the winter months (Table 2d).

Comparison of the numbers of captured birds (standardized for net-area-hours) at Lee's Creek Road and New Chums Road, indicates that three patterns are evident (Table 3):

- (i) the numbers of individuals for four species are higher at Lee's Creek Road than New Chums Road during winter (White's Thrush, Rose Robin, Golden Whistler, Red-browed Firetail) although many individuals of the last three species appear to continue to pass through both study sites;
- (ii) six species increase in numbers at Lee's Creek Road in autumn, (Flame Robin, Grey Fantail, Yellow-faced Honeyeater, White-naped Honeyeater, Silvereye, Red-browed Firetail). Similar increases occur in only three species at New Chums Road (Yellow-faced and White-naped Honeyeaters, Red-browed Firetail). The most marked increase is for the Yellow-faced Honeyeater at Lee's Creek;
- (iii) one species disappears from both sites during winter (Rufous Fantail) while three more do not occur at Lee's Creek Road during winter (Grey Fantail, Yellow-faced Honeyeater, Silvereye) with the summer to winter decline being most marked for the Silvereye.

No data were collected for these species during the winter at Blundell's Creek Road but standardized figures from other seasons indicate trends

TABLE 1

Summary of capture/recaptures and longevity of 52 species banded at New Chums Road, Brindabella Ranges, A.C.T., 1961 to 1979.

Species	Captures	Recaptures	Percentage of juveniles recaptured as adults	Total records by season				Longevity		
				Summer	Autumn	Winter	Spring	Year	Month	
Brown Goshawk	<i>Accipiter fuscatus</i>	1					1			
Brush Bronzewing	<i>Phaps elegans</i>	1			1					
Wonga Pigeon	<i>Leucosarcia melanoleuca</i>	6		2	3		1			
Crimson Rosella	<i>Platycercus elegans</i>	18	1	8	6		5	2	2	
Fan-tailed Cuckoo	<i>Cuculus pyrrhophanus</i>	16	2	4	4		10	5	11	
Horsfield's Bronze-cuckoo	<i>Chrysococcyx basalis</i>	3		1			2			
Shining Bronze-cuckoo	<i>Chrysococcyx lucidus</i>	23	3	13			13	1	10	
Australian Owllet-nightjar	<i>Aegothelus cristatus</i>	6	1	2	2	1	2	0	5	
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	7		4	2		1			
White's Thrush	<i>Zoothera dauma</i>	255	81	6	132	31	15	158	7	1
Blackbird	<i>Turdus merula</i>	3	1		3	1			0	1
Rose Robin	<i>Petroica rosea</i>	251	67	13	108	63	2	145	5	11
Pink Robin	<i>Petroica rodinogaster</i>	28	10			18	19	1	2	0
Flame Robin	<i>Petroica phoenicea</i>	289	61	18	172	83	11	84	5	8
Scarlet Robin	<i>Petroica multicolor</i>	2			1			1		
Red-capped Robin	<i>Petroica goodenovii</i>	5	1		5			1	0	1
Eastern Yellow Robin	<i>Eopsaltria australis</i>	512	314	27	258	258	113	197	12	10
Crested Shrike-tit	<i>Falcunculus frontatus</i>	10	3		1	5	2	5	1	8
Olive Whistler	<i>Pachycephala olivacea</i>	78	30	3	23	30	20	35	5	8
Golden Whistler	<i>Pachycephala pectoralis</i>	470	171	8	289	55	6	291	10	11
Rufous Whistler	<i>Pachycephala rufiventris</i>	29	5	40	18	3		13	4	11
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	71	15	20	35	7	6	38	8	0
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	2				2				
Rufous Fantail	<i>Rhipidura rufifrons</i>	298	65	6	239	44		80	7	0
Grey Fantail	<i>Rhipidura fuliginosa</i>	340	47	4	144	61	5	176	3	10
Eastern Whipbird	<i>Psophodes olivaceus</i>	26	7		8	11	3	11	6	5
Spotted Quail-thrush	<i>Cinelosoma punctatum</i>	1				1				
Superb Fairy-wren	<i>Malurus cyaneus</i>	29	22		6	30	12	3	4	1
Pilotbird	<i>Pycnonotus floccosus</i>	92	31		63	22	14	24	6	3
White-browed Scrubwren	<i>Sericornis frontalis</i>	1 783	1 725	21	1 221	987	477	823	14	5
Brown Thornbill	<i>Acanthiza pusilla</i>	1 333	594	16	548	577	309	493	13	5
Striated Thornbill	<i>Acanthiza lineata</i>	554	368	3	150	267	241	264	9	6
White-throated Treecreeper	<i>Climacteris leucophaea</i>	119	75	13	70	35	36	53	11	6
Red-browed Treecreeper	<i>Climacteris erythroptis</i>	42	31	13	25	10	8	30	8	3
Red Wattlebird	<i>Anthochaera carunculata</i>	3			1	1		1		
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	968	201		461	342	12	354	12	5
White-eared Honeyeater	<i>Lichenostomus leucotis</i>	275	41	32	101	109	33	73	4	0
Yellow-tufted Honeyeater	<i>Lichenostomus melanops</i>	3				2	1			
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>	21	2		2	18		3	3	7
White-naped Honeyeater	<i>Melithreptus lunatus</i>	534	112	14	222	196	25	203	10	0
Crescent Honeyeater	<i>Phylidonyris pyrrhoptera</i>	275	87	1	120	73	68	101	9	11
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	3			1	1		1	2	5
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	255	70	3	169	25	15	116	10	6
Mistletoebird	<i>Dicaeum hirundinaceum</i>	3			3					
Spotted Pardalote	<i>Pardalotus punctatus</i>	148	6	33	44	57	21	32	0	6
Striated Pardalote	<i>Pardalotus striatus</i>	1				1				
Silvereye	<i>Zosterops lateralis</i>	1 214	310		766	245	7	506	7	11
Red-browed Firetail	<i>Emblema temporalis</i>	104	31		47	53	3	32	1	11
Satin Bowerbird	<i>Ptilonorhynchus violaceus</i>	6			3	2		1		
Grey Butcherbird	<i>Craicticus torquatus</i>	4				1	3			
Pied Currawong	<i>Strepera graculina</i>	18	6		7	2		15	1	11
Grey Currawong	<i>Strepera versicolor</i>	2			1			1		
Total Captures/Recaptures	10 540	4 597								
Total number per (net) × (m <sup>2</sup> ) × (hr)					219 612	154 240	118 622	202 681		

TABLE 2

(a) Species with less than 10 banding records at New Chums Road but never recaptured.

Brown Goshawk	Red Wattlebird
Brush Bronzewing	Yellow-tufted Honeyeater
Wonga Pigeon	New Holland Honeyeater
Hosfield's Bronze-Cuckoo	Mistletoebird
Laughing Kookaburra	Striated Pardalote
Scarlet Robin	Satin Bowerbird
Satin Flycatcher	Grey Butcherbird
Spotted Quail-thrush	Grey Currawong

(b) Species with less than 10 banding records but were recaptured

Australian Owllet-nightjar	Red-capped Robin
Blackbird	

(c) Species with more than 1 000 banding and recapture records

White-browed Scrubwren	Yellow-faced Honeyeater
Brown Thornbill	Silvereye

(d) Species with a minimum of 40 records that show a marked decline at New Chums Road in winter

White's Thrush	Grey Fantail
Rose Robin	Yellow-faced Honeyeater
Flame Robin	White-naped Honeyeater
Golden Whistler	Eastern Spinebill
Grey Shrike-thrush	Silvereye
Rufous Fantail	Red-browed Firetail

similar to those occurring at Lee's Creek Road although absolute numbers of each species are generally higher at Blundell's Creek Road. Numbers for Yellow-faced Honeyeaters and White-naped Honeyeaters at Blundell's Creek Road increased from 422.0 and 402.5 in summer to 3 156.9 and 1 360.0 in autumn, respectively. These are more than twice the increase for the same species at Lee's Creek Road. The congregations remained at these lower sites for several weeks but most departed by the first week of April.

Recapture information from other sites in the A.C.T. also suggests altitudinal migration. For example, an Eastern Spinebill (Band number 013-31971) that was banded at the Australian National Botanic Gardens, Canberra (30 June, 1979) was retrapped at New Chums Road (20 October, 1979), again at the Gardens (2 May, 1981) and finally at New Chums Road (13 September, 1981). The distance between the sites is 28 km and 500 m in altitude.

The ratio of summer to winter captures shows similar values at New Chums Road and Lee's Creek Road, although there is a smaller number of species present in winter at Lee's Creek Road. These comparisons are not very reliable because of the low and seasonal nature of the trapping effort at Lee's Creek Road.

TABLE 3

Standardized captures (number per 10<sup>4</sup> net-area-hours) at New Chums Road, 1961 to 1979, and Lee's Creek Road 1961 to 1973, 1978 to 1979, for each season with the ratio of summer to winter captures.

	New Chums Road					Lee's Creek Road				
	Summer	Autumn	Winter	Spring	Summer/ Winter Ratio	Summer	Autumn	Winter	Spring	Summer/ Winter Ratio
White's Thrush	18.7	6.2	3.9	24.2	4.8	16.4	11.5	12.7	20.8	1.3
Rose Robin	15.3	12.7	0.5	22.2	30.6	12.2	8.8	2.0	27.5	6.1
Flame Robin	24.4	16.7	2.9	12.9	8.4	5.7	9.3	1.0	8.1	5.7
Golden Whistler	40.9	11.1	1.6	44.6	25.6	44.0	18.0	3.0	39.7	14.7
Grey Shrike-thrush	5.0	1.4	1.6	5.9	3.1	5.7	1.4	1.0	5.0	5.7
Rufous Fantail	33.8	8.9	0.0	12.3		58.9	1.5	0.0	26.6	
Grey Fantail	20.4	12.3	1.3	27.0	15.7	13.8	18.5	0.0	36.1	
Yellow-faced Honeyeater	65.2	68.9	3.1	54.3	21.0	95.2	262.2	0.0	109.8	
White-naped Honeyeater	31.4	39.5	6.6	31.1	4.8	45.5	71.6	3.9	72.2	11.7
Eastern Spinebill	23.9	5.0	4.0	17.8	6.0	37.5	8.8	1.0	16.7	37.5
Silvereye	108.4	49.3	1.8	77.6	60.2	206.4	282.5	0.0	57.8	
Red-browed Firetail	6.6	10.7	0.8	4.9	8.3	3.5	5.5	1.0	7.2	3.5



of the most notable year-round residents (Eastern Yellow Robin, Olive Whistler, White-browed Scrubwren, Brown and Striated Thornbills, White-throated Treecreeper, White-cared Honeyeater, Crescent Honeyeater and Spotted Pardalote) are no lower than would be expected following the dispersal of young and mortality. Records for Striated Thornbill are higher in winter than summer suggesting that this species comes down from the canopy more to feed as the ambient temperature decreases. On the whole, there is a higher proportion of banded young recaptured as adults among the winter residents than of the other species, particularly those species which form flocks or year-round family groups. We suggest that individuals of these species that leave the area are mostly non-breeders or young birds whereas all age classes make up the exodus of the migratory species. The difference in patterns of exodus suggest that there are differences in temperature tolerance within related species (e.g., honeyeaters) but also that food availability is a limiting factor for many.

The vegetation at Blundell's Creek Road is a little more open, and the creek a little more swampy, than at Lee's Creek Road but these differences seem insufficient to account for the accumulation of honeyeaters at Blundell's Creek Road. For whatever reasons, Blundell's Creek Road appears to be a more major assembly point than Lee's Creek Road for honeyeaters moving down from the higher parts of the Brindabella Range before they move east.

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