THE SUNBIRD

Volume 32 No's. 2 & 3 December 2002

THE BIRDS QUEENSLAND GARDEN BIRD SURVEY, 1999-2000

PETER F. WOODALL

ABSTRACT

Birds Queensland conducted a Garden Bird Survey amongst its members during 1999/2000. They completed surveys in 123 gardens producing an average of 28.5 weeks of records per garden. A mean number of 30 bird species was recorded in gardens, and a cumulative total of 255 species were reported. The gardens are concentrated mainly in Brisbane suburbs (74) and the majority are situated within southeastern Queensland (100). The remaining gardens (23) are located at other more distant centres (e.g. Dalby and Cairns) within the state. Compared to gardens used for a similar survey conducted during 1979/80 (Woodall 1995) the gardens in the present survey were older but of similar size (approximately 800 m^2) with less open space, more tall trees and fewer were adjacent to bushland.

An analysis of the relative abundance and frequency of occurrence of the most recorded bird species is presented. The Rainbow Lorikeet scored the highest percentage frequency by site (93%) and the highest mean maximum numbers (4.7), but the Noisy Miner had the highest percentage frequency by weeks (67%). Compared with the 1979/80 survey the percentage frequencies of 19 (mainly large) species of birds have increased by over 10%, and 10 (mainly small) species of birds have decreased by over 10%, in gardens during the past 20 years.

INTRODUCTION

Suburban gardens provide potential habitat for many species of birds and some adapt to a garden environment better than others. Because adaptation is a dynamic process the composition of the avifauna is likely to change with time (Jones & Wieneke 2000, Veerman 2002). Describing suburban bird communities

and measuring changes in them over time gives insights into the interactions of their constituent species within natural habitats.

Observing birds in gardens engages suburban people in recording changes in natural processes and the conservation requirements of birds (Cannon 1999). Since the first Queensland Ornithological Society Garden Bird Survey in 1979/80 (Woodall 1995) other large-scale garden bird surveys have been conducted in Brisbane (Sewell & Catterall 1998), Townsville (Jones & Wieneke 2000), Tasmania (Moverley 1997), Canberra (Veerman 2002) and Australia-wide (Wilson 1994). The most comprehensive of these (Veerman 2002) extends over 18 years and includes over 200 sites.

The results of this 1999/2000 Birds Queensland Garden Bird Survey are reported and compared with the results of a similar survey (Woodall 1995) conducted over 20 years ago. Future more detailed investigations concentrating on individual species and investigating seasonal changes in urban avifauna are being planned.

METHODS

In 1999 members of Birds Queensland were invited to survey birds in their gardens for a year. Monthly newsletters containing survey-recording forms were sent to all members from February onwards. To make this survey as comparable as possible with the 1979/80 survey (Woodall 1995) the instructions and the forms were essentially identical.

Members were asked to record weekly the maximum number of sightings for each species seen in their garden (IN); in adjacent gardens or areas (NG); and flying over their garden (FO). These reporting categories (IN, NG and FO) were used to reduce the tendency of recorders to inflate their garden records with birds seen nearby. As with the 1979/80 survey, only those species recorded in gardens were used in the analysis but complete totals for each garden (including NG and FO) are given in Appendix I. The English names of birds used here follow those of Christidis & Boles (1994). The weekly data from members was collated and analysed to describe and compare the frequencies and the abundances of birds visiting the gardens.

A species percentage frequency is the number of times that species was recorded as a percentage of all records (e.g. if a species was seen in every week of the survey its percentage frequency would be 100%). This provided a measure of how often the species was seen. A species percentage frequency can be calculated in two ways to measure either its geographical extent or its temporal persistence in gardens.

(a) By site, using the garden as the unit of observation (n= 123) provides a measure of the species geographic distribution (but one record from a garden equates to up to 52 weeks of records of another species).

(b) By week, combining records for all gardens and using the week as the unit of observation (n= 3515) provides both a temporal and geographical measure of the species occurrence. For example, a species might be present all year but if restricted to a few gardens would have a low percentage frequency.

A species mean maximum number was calculated from the maximum numbers of a species reported weekly (including 'zero' records). This parameter is a measure of the relative abundance of a species but not its absolute abundance, or population density.

As the survey concluded, a second form was sent to all members requesting some details about the gardens being surveyed (e.g. size; age; vegetation; water and food supplies for the birds; presence of domestic pets). These descriptions enabled the gardens involved in the present survey to be compared with those used in the 1979/80 survey (Woodall 1995).

RESULTS

Over 120 members of Birds Queensland contributed records to the 1999/2000 Garden Bird Survey. The locations of the gardens surveyed and some of their survey results are shown in Appendix 1. The 123 gardens were concentrated in Brisbane (74) and its adjacent centres of Ipswich (6) the Gold Coast (7) and Sunshine Coast (13) in the south east Queensland region, but also included 23 gardens from more distant country centres in Queensland, north as far as Julatten, and west as far as Pittsworth.

The 1999/2000 Garden Bird Survey included more gardens and produced more weekly records (Table 1) than the earlier survey completed in 1979/1980 (Woodall 1995). The mean number of weekly surveys per garden (i.e. from IN the garden), the total number of species, the mean number of species per garden and the median size of gardens in both surveys were similar (Table 1). Thus there were no major differences between the two surveys in terms of the sampling effort or the size of the gardens sampled.

Table 1. The Statistics of both 12 month Garden Bird Surveys.

Statistic	1979/1980	1999/2000
Bird Species	257	255
Species Mean (IN garden/site)	31	30.1
IN Records (sites x weeks)	2826	3515
Mean survey length (weeks/site)	28.2	28.5
Gardens in survey (sites)	100	123
Median garden size (m^2)	835	800

The sizes and the conditions within the gardens included in the 1999/2000 Garden Bird Survey (Table 2) were obtained from information contained in 82 questionnaires returned by members. More gardens contained water available to birds than did those in the 1979/80 survey but few included in either survey provided supplementary food for birds at bird tables. Cats were reported as sometimes present in most gardens**,** and dogs were reported (in approximately 50% of gardens), both less frequently than for the 1979/80 survey. There were also fewer reports of caged birds or poultry being kept in the gardens surveyed in 1999/2000 than in 1979/1980.

A majority of gardens described in 1999/2000 (63%) included open spaces (usually lawns) on less than 40% of their area (c.f. 44% of gardens in 1979/1980) and the mean number of large trees (> 3 m in height) was 34 (c.f. 22 in 1979/80). Most gardens had nectar-producing plants such as *Grevillea,*

Table 2. Characteristics of 82 gardens in the 1999/2000 Garden Bird Survey.

Characteristics	Percentages of Gardens in Survey		
	Never	Sometimes	Regularly
Water available	17	10	73
Bird Food available	60	20	20
Cats present	27	44	29
Dogs present	49	26	25
Caged Birds present	86	-	14
Lawn or Grass (Percentage area)	63 (0 –40)	28 (41-70)	9 (71-100)
Bushland adjacent (None-All sides)	71 (None)	27 (One-Three)	2 (All)

Ages of gardens (Years)	11 (<5)	11 (6-10)	22 (11-20)	56 (>20)

Banksia or *Callistemon* spp., with a mean number of 8.3 per garden (c.f. 9.4 recorded in 1979/80).

In the present survey a majority (56%) of gardens were over 20 years old (c.f. only 29% in 1979/80) and 71% were not adjacent to bushland (c.f. 54% in 1979/80).

The median areas of the gardens sampled in both surveys was similar, 835 m^2 in 1999/2000 and 800m^2 in 1979/80. Overall, the gardens sampled during the present survey were older, with less open space, more tall trees, fewer pets, more likely to provide water and reduced proximity to bushland when compared with gardens in the earlier survey.

Monthly rainfall totals recorded from the southeastern region of the state "South Coast – Moreton" (Anon. 1978-2000) where most of the gardens occur are shown in (Figure 1) to help interpret and compare the results of the surveys. Annual rainfall in 1998 was below average (1026mm) but from February 1999 to January 2000 (when most records of this survey were completed) it was 1546mm, well above the mean annual rainfall of 1146mm for the region. There was exceptionally high rainfall in February 1999 (Fig. 1). Total annual rainfall from May 1979 to April 1980 (when most records of the previous survey were completed) and for the previous year, May 1978 to April 1979, were 761 mm and

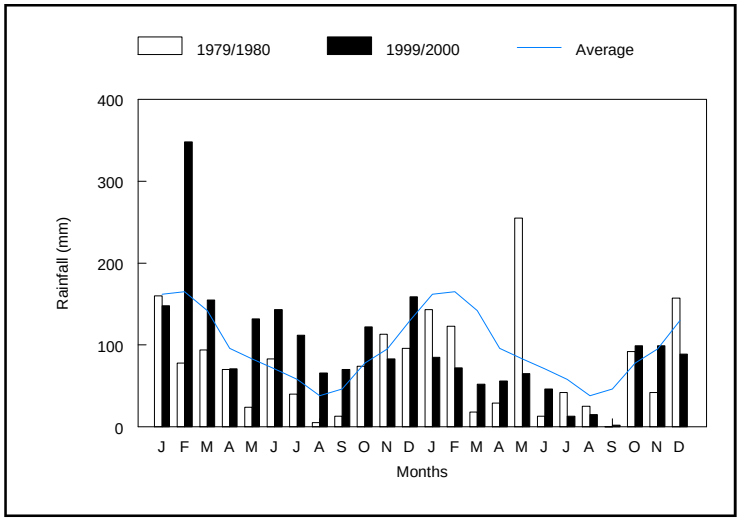

Fig. 1. Rainfall in 1979/80 and 1999/2000 for "South Coast – Moreton" after Anon. (1978-2000).

TABLE 3. The percentage frequencies and abundances (mean max. no./week) of common garden birds recorded for 1999/00 and 1979/80 Garden Bird Surveys.

Bird Species (N=50 in order of 99/00 % frequency x site)	% Frequency (x site)		% Frequency (x week)		Mean. No. (includes 0's)	
	99/00	79/80	99/00	79/80	99/00	79/80
Rainbow Lorikeet	93	47	64	18	4.7	1.2
Laughing Kookaburra	86	77	45	33	1.0	0.71
Australian Magpie	85	74	57	41	1.4	1.3
Torresian Crow	85	71	51	37	1.9	1.1
Magpielark	80	79	58	44	1.3	1.0
Noisy Miner	79	56	67	33	3.8	1.9
Black-faced Cuckoo-shrike	77	84	37	48	0.81	1.3
Figbird	77	61	35	27	1.5	1.5
Spotted Turtledove	76	60	57	42	1.8	1.2
Crested Pigeon	71	37	48	23	1.7	0.93
Pale-headed Rosella	70	66	46	34	1.1	0.87
Blue-faced Honeyeater	67	43	30	16	0.86	0.50
Scaly-breasted Lorikeet	65	44	30	17	1.7	1.1
Spangled Drongo	64	66	22	23	0.42	0.43
Grey Butcherbird	64	50	39	26	0.80	0.67
Pied Butcherbird	64	63	32	29	0.69	0.64
Willie Wagtail	63	85	34	46	0.56	0.77
Common Koel	62	34	14	8	0.21	0.11
Brown Honeyeater	61	52	32	30	0.74	0.91
Silvereye	61	76	24	51	1.6	3.8
Noisy Friarbird	56	57	26	27	0.52	0.74
Little Friarbird	50	49	17	22	0.41	0.59
Pied Currawong	44	27	18	8	0.47	0.29
Galah	41	21	16	5	1.0	0.77
Sulphur-crested Cockatoo	41	9	13	1	0.45	0.01
Olive-backed Oriole	39	41	10	13	0.15	0.21
House Sparrow	37	69	18	53	1.0	6.6
Pheasant Coucal	34	27	8	5	0.11	0.06
Welcome Swallow	32	52	10	18	0.35	1.0
Striated Pardalote	31	51	11	17	0.19	0.26
Sacred Kingfisher	30	51	5	12	0.07	0.16
Grey Fantail	30	57	7	16	0.12	0.27
Channel-billed Cuckoo	28	9	5	1	0.08	0.01
Common Myna	28	5	11	5	0.59	0.39
Common Starling	27	43	7	19	0.46	1.4
Australian Brush Turkey	27	5	13	1	0.39	0.01
Tawny Frogmouth	26	22	4	4	0.05	0.05
White-faced Heron	26	29	4	4	0.04	0.04
Dollarbird	26	28	4	5	0.07	0.09
Scarlet Honeyeater	26	28	4	8	0.10	0.15
Southern Boobook	24	13	4	1	0.04	0.01
Rainbow Bee-eater	24	28	3	8	0.13	0.32
Mistletoebird	24	35	7	13	0.09	0.20
Australian King Parrot	21	9	10	2	0.43	0.06
Lewin's Honeyeater	21	18	11	5	0.22	0.26
Peaceful Dove	20	20	10	9	0.50	0.61
Bar-shouldered Dove	18	18	10	10	0.76	0.31
Rufous Whistler	18	50	5	17	0.07	0.26
Masked Lapwing	17	15	3	5	0.06	0.12
Grey Shrike-thrush	17	24	6	10	0.07	0.15

998mm respectively. Both these annual rainfall totals were well below the regional mean annual rainfall of 1146mm.

The 1999/2000 Garden Bird Survey recorded a cumulative total of 255 species of birds but many of these species were recorded from just a few gardens. For example, 186 species of birds were recorded from less than 10% of gardens in the survey. The 50 most commonly recorded bird species during the survey are listed in Table 3 by their percentage frequencies (by site and by week) along with their mean numbers (relative abundances) and the corresponding results from the 1979/80 survey.

The differences between the results of the two Garden Bird Surveys shown in Table 3 imply that changes have occurred in the composition and abundance of birds that visit such gardens over the past 20 years. These changes are summarised in Table 4. (See page 8)

Nineteen species show increases in percentage frequency (by site) by > 10% and ten species show decreases in percentage frequency of 10% or greater since the previous survey. Generally this may seem a positive result with the number of species increasing their percentage frequencies in gardens nearly double that of those showing decreases. However, the change has not been uniform across the biota. All birds that increased their visits to gardens were large bodied species (with a group mean mass of 368g) and all those that decreased their garden visits were small species (with a group mean mass of 24g).

DISCUSSION

To detect changes to the avifauna of gardens over the 20-year period an ideally designed Garden Bird Survey would have monitored the same set of gardens. Though this was clearly impractical, and very few gardens were included in both surveys, similarly skilled observers (QOSI/Birds Queensland members) and identical instructions and recording sheets were employed. The results of both surveys are in accord in many important respects (Table 1) and this suggests that the changes detected in the avifauna of gardens over the 20-year period are valid and are not artefacts of the methodology. There were differences in the age of the gardens, their vegetation and seasonal weather.

Both Garden Bird Surveys were preceded by years of limited rainfall. The1999/2000 survey period received above average rainfall while the 1979/80 survey period had below average rainfall. Some of these differences would contra-indicate the results obtained (i.e. higher rainfall, older gardens with more

TABLE 4. Common garden birds that changed their percentage frequencies by > 10% (see Table 3) in the past 20 years and their body size.

Species	% change (x site)	% change (x week)	Mass (g)#
Increased percentage frequency since 1979/80			
Rainbow Lorikeet	46***	46	132
Crested Pigeon	34***	25	206
Sulphur-crested Cockatoo	32***	12	790
Common Koel	28**	7	260
Blue-faced Honeyeater	24**	14	102
Noisy Miner	23*	34	60
Common Myna	23***	5	110
Australian Brush Turkey	22***	12	2330
Scaly-breasted Lorikeet	21*	13	86
Channel-billed Cuckoo	21**	4	684
Galah	20**	11	312
Pied Currawong	17*	9	275
Figbird	16	8	135
Spotted Turtle-dove	16	15	160
Torresian Crow	14	14	480
Grey Butcherbird	14	13	92
Australian King Parrot	12*	8	208
Australian Magpie	11	16	300
Southern Boobook	11	2	280
		Mean	368
Decreased percentage frequency since 1979/80			
House Sparrow	32***	35	30
Rufous Whistler	32***	12	23
Grey Fantail	27**	9	8
Willie Wagtail	22	12	20
Sacred Kingfisher	21*	7	45
Welcome Swallow	20*	9	13
Striated Pardalote	20*	6	10
Common Starling	16*	12	75
Silvereye	15	27	12
Mistletoebird	11	6	8
		Mean	24

* =P<0.05; ** = P<0.01; *** = P<0.001 (Chi-squared test on raw numbers)

After Higgins (1999), Higgins & Davies (1996) and Higgins *et al.* (2001), or Hall (1974), Long (1981), Robertson and Woodall (1982).

vegetation cover could intuitively favour smaller species of birds), or cancel the opposing effects of greater isolation from adjacent bushland (which may not favour all the smaller species).

Despite differences in survey conditions the results show clear change has occurred in the composition of garden avifauna over the period. Nineteen larger bird species (>100g) have significantly increased, and ten smaller species (<50g) have declined, in their frequencies and abundances in urban Queensland gardens, at the least within the region of southeastern Queensland.

The results provide evidence for the subjective comments and impressions of the community and Birds Queensland members during this 20-year period (e.g. the often remarked upon increase in the number of Torresian Crows and Pied Currawongs). Increases in such species with perceived negative consequences are more memorable than similar increases in the more benign species like Rainbow Lorikeets and Blue-faced Honeyeaters. Significant declines in abundance and frequency of the smaller bird species visiting gardens are much less noticeable to a casual observer.

These serial Garden Bird Surveys have dynamically demonstrated the conclusion common to most Australian garden bird surveys that birds in gardens tend to be big because small birds are driven out (Low 2002). The Willie Wagtail was the most common garden bird (85% percentage frequency by site) during the 1979/80 Garden Bird Survey (Woodall 1995) but it is now in 17th position. Silvereyes and House Sparrows were also in the top ten species but there are now no small birds (<80g) in the top ten (except for the Noisy Miner).

The Noisy Miner is a highly aggressive and colonial species (Dow 1977) often implicated in the declines of smaller garden birds (Woodall 1996, Sewell & Catterall 1998, Low 2002). The 23% increase in its percentage frequency by site demonstrated here over the 20-year period may well account for the declines in some of the smaller garden species.

Species that increased in gardens during the Garden Bird Surveys are not primarily bushland species of the Brisbane region (Sewell and Catterall 1998). They are either tolerant (common in some bushland and in some suburbs), suburban species or species unallocated to any particular habitat because of their low frequency. In contrast three bushland species (*sensu* Sewell and Catterall (1998)) the Rufous Whistler, Grey Fantail and Striated Pardalote have declined in gardens during the past 20 years even though there is now less open space in gardens (Table 2). Significantly, fewer gardens are now adjacent to bushland (the population source for many of these small insectivorous birds) and the Noisy Miner has increased.

The presence of introduced birds in suburban gardens is also changing with mixed fortunes for some. The Spotted Turtle Dove which showed a modest 16% increase (Table 4) is now the only introduced species in the top 20 garden bird species and the House Sparrow is no longer in this group. The Crested Pigeon percentage frequency by site increased by 34% and may soon overtake the Spotted Turtle Dove.

The Common Starling at 75g is the largest species (Table 4) to decline over the 20 years both, in terms of the percentage of gardens and the percentage frequency by weeks (Table 3). The Common Myna is increasing in gardens although the overall reporting rate is still low (Tables 3 & 4). Jones and Wieneke (2000) have reported an increase in the Common Myna in Townsville. Veerman (2002) and Pell & Tidemann (1997) predicted that the more aggressive Common Myna will replace the Common Starling in gardens elsewhere and that both, particularly the Common Myna, adversely affect breeding rosellas by competing for nesting hollows.

The House Sparrow declined markedly in gardens over the 20-year period. In Brisbane gardens the Noisy Miner may be implicated (Woodall 1996) but the House Sparrow has declined elsewhere, where the Noisy Miner is not well established (Veerman 2002), or is absent (Jones and Wieneke 2000). Gardens included in the present study contained less lawn area (i.e. fewer grass seeds or insects) and poultry or cage birds (i.e. less spilt grain). Improved roof design and maintenance (primarily to exclude possums) have reduced nesting cavities for both House Sparrow and Common Starling in urban houses. House Sparrow declines overseas (Summers-Smith 1999, Sanderson 2001, Prowse 2002) also implicate quite different causes.

The 1999/2000 Garden Bird Survey has provided valuable information and insight into the changing nature of suburban bird populations in Queensland. I strongly recommend the next garden bird survey be undertaken in Queensland well before another 20 years have elapsed.

ACKNOWLEDGEMENTS

I am very grateful to the members of Birds Queensland who recorded birds in their gardens and provided the essential data for this project. I hope that they enjoyed the exercise. I also thank the executive members of Birds Queensland who supported this Garden Bird Survey and the volunteers who inserted the forms and instructions into the Birds Queensland Newsletter each month for the duration of the project. Dr David McFarland made valuable comments on the manuscript.

REFERENCES

ANON. 1978-2000. *Monthly Weather Review. Queensland.* Melbourne: Bureau of Meteorology.

CANNON, A. 1999. The significance of private gardens for bird conservation. *Bird Conservation International* 9: 287-297.

CHRISTIDIS, L. & BOLES, W.E. 1994. *The Taxonomy and Species of Birds of Australia and its Territories.* Royal Australasian Ornithologists' Union Monograph 2. Melbourne: RAOU.

DOW, D.D. 1977. Indiscriminate interspecific aggression leading to almost sole occupancy of space by a single species of bird. *Emu* 77: 115-11.

HALL, B.P. 1974. *Birds of the Harold Hall Australian Expeditions, 1962-1970.* London: British Museum (Natural History).

HIGGINS, P.J. (Ed) 1999. *The Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Parrots to Dollarbird.* Melbourne: Oxford University Press.

HIGGINS, P.J. & DAVIES, S.J.J.F. (Eds.) 1996. *The Handbook of Australian, New Zealand and Antarctic Birds. Vol. 3. Snipe to Pigeons.* Melbourne: Oxford University Press.

HIGGINS, P.J., PETER, J.M. & STEELE, W.K. (Eds.) 2001. *The Handbook of Australian, New Zealand and Antarctic Birds. Vol. 5. Tyrant-flycatchers to Chats.* Melbourne: Oxford University Press.

JONES, D.N. & WIENEKE, J. 2000. The suburban bird community of Townsville revisited: changes over 16 years. *Corella* 24: 53-60.

LONG, J.L. 1981. *Introduced Birds of the World.* Sydney: A.H. & A.W. Reed.

LOW, T. 2002. *The New Nature.* Camberwell, Victoria: Penguin Books.

MOVERLEY, J. 1997. Birds Tasmania Garden Bird Survey, 1994-1995. General Results. *Tasmanian Bird Report* 26: 5-17.

PELL, A.S. & TIDEMANN, C.R. 1997. The impact of two exotic hollow-nesting birds on the native parrots in savannah and woodland in eastern Australia. *Biological Conservation*. 79: 145-153.

PROWSE, A. 2002. The urban decline of the House Sparrow. *British Birds* 95: 143-146.

ROBERTSON, J.S. & WOODALL, P.F. 1982. Bird weights and measurements from Wellington Point, south-east Queensland. *Sunbird* 12: 1-9.

SANDERSON, R. 2001. Further declines in an urban population of House Sparrows. *British Birds*. 94: 507-508.

SEWELL, S.R. & CATTERALL, C.P. 1998. Bushland modification and styles of urban development: their effects on birds in south-east Queensland. *Wildlife Research* 25: 41-63.

SUMMERS-SMITH, J.D. 1999. Current status of the House Sparrow in Britain. *British Wildlife* 10: 381-386.

VEERMAN, P.A. 2002. *Canberra Birds: a Report on the first 18 years of the Garden Bird Survey*. Kambah, ACT: Privately published.

WILSON, Z. 1994. BOCA Birds and gardens survey 1991. *BOCA Report No. 3*.

WOODALL, P.F. 1995. Results of the QOS garden bird survey, 1979-80, with particular reference to south-east Queensland. *Sunbird* 25: 1-17.

WOODALL, P.F. 1996. Limits to the distribution of the House Sparrow *Passer domesticus* in suburban Brisbane, Australia. *Ibis* 138: 337-340.

P.F. WOODALL, *School of Veterinary Science,*
University of Queensland, Brisbane, Q. 4072.

APPENDIX 1. Observers and localities of the Birds Queensland Garden Bird Survey, 1999/2000.

Brisbane - North				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Spring Hill	4000	Pegg	47	38
Spring Hill	4000	Nolan	4	18
Wavell Hts	4012	Sharp	4	17
Nundah	4012	Sonnenburg	54	65
Wavill Hts	4012	Hammill	4	20
Shorncliffe	4017	McMahon	4	24
Taigum	4018	Kuerschner	53	56
Kedron	4031	Harris	10	26
Geebung	4034	Samways	5	19
Bridgeman Downs	4035	Elliott	50	58
Albany Creek	4035	Howes	32	39
Enoggera	4051	Grundy	30	36
Grange	4051	Ponniah	5	16
Enoggera	4051	Leahy	21	15
McDowall	4053	Green	55	42
Stafford	4053	Robbie	54	48
Everton Hills	4053	Moore	44	26
Keperra	4054	Watt	24	25
Keperra	4054	Lamke	4	7
Ferny Grove	4055	Roper	5	18
Kelvin Grove	4059	Mott	45	22
Ashgrove	4060	Hacker	30	33
The Gap	4061	Francis	42	35
The Gap	4061	Keir	46	27
The Gap	4061	Schofield	46	41
Bardon	4065	O'Connor	33	26

Brisbane – West				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Toowong	4066	Power	25	14
Toowong	4066	Mellor	20	35
St Lucia	4067	Muir	56	21
Kenmore	4067	Clark	22	30
Indooroopilly	4068	Laundon	54	31
Indooroopilly	4068	Thomson	52	49
Taringa	4068	Laundon	24	21
Kenmore	4069	Bullock	55	33
Kenmore	4069	Beck	54	25
Chapel Hill	4069	Collins	30	35
Brookfield	4069	Roe	37	71
Kenmore	4069	Venables	57	35
Pullenvale	4069	Goadby	1	20
Kenmore	4069	Gynther	27	45

Gold Coast				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Mudgeeraba	4213	Waugh	49	48
Southport	4215	Morton	25	32
Southport	4215	Robinson	9	33
Runaway Bay	4216	Reilly	50	50
Anglers Paradise	4216	Dick	51	35
Biggera Waters	4216	Hughes	7	22
Broadbeach Waters	4218	Chandler	49	62

Brisbane – South				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Middle Park	4074	Walker	10	15
Sherwood	4075	Brazier	53	37
Corinda	4075	Cole	46	56
Corinda	4075	Thornton	15	26
Corinda	4075	Niland	17	35
Doolandella	4077	Harding	5	18
Durack	4077	White	5	30
Highgate Hill	4101	Cassels	52	67
Woolloongabba	4102	Martin	1	20
Yeronga	4104	Wilesmith	59	38
Moorooka	4105	Woodall	50	39
Sunnybank	4109	Jones	57	45
8 Mile Plains	4113	Raboczi	36	41
Holland Park	4121	Brumpton	10	40
Holland Park	4121	Evans	5	30
Wishart	4122	Adamson	48	24
Mansfield	4122	Watson	37	23
Mt Gravatt	4122	Elliott	5	14
Marsden	4132	Hush	3	36

Brisbane – East				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Carina	4152	Crow	48	43
Carindale	4152	Keates	44	51
Camp Hill	4152	Sulakatku	10	28
Carina	4152	Wennink	5	15
Carina Heights	4152	Popple	5	18
Chandler	4155	Morgan	48	80
Wellington Py	4160	Tyson	49	46
Redland Bay	4165	Hilless	4	16
Norman Park	4170	McGregor	4	7
Bulimba	4171	Fawdry	3	21
Balmoral	4171	Dufton	5	22
Murarrie	4172	Pittam	35	43
Tingalapa	4173	Sparks	37	28
Bethania	4205	Bloss	27	34
Beenleigh	4207	Wagner	9	12

Ipswich and West				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Raceview	4305	King	55	59
Ipswich	4305	Elliott	25	40
Karana Downs	4306	James	7	49
Boonah	4310	Dunn	37	61
Boonah	4310	Fisher	5	28
Esk	4312	Pearce	37	54
Toowoomba	4350	McKilligan	53	55
Toowoomba	4350	Glass	32	58
Toowoomba	4350	Swarbrick	14	22
Pittsworth	4356	Walter	45	79
The Summit	4377	Aitken	29	60
Dalby	4405	Wilson	38	34

Sunshine Coast				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Lawnton	4501	Smith	6	34
Burpengary	4505	Noyce	14	50
Bribie Island	4507	Hallett	41	82
Bellmere, Caboolture	4510	Cross	51	123
Peachester	4519	Atkinson	42	73
Forest Glen	4556	Hansen	38	116
Buderim	4556	Dunn	40	43
Maroochydore	4558	Wilson	2	16
Nambour	4560	Rooke	54	33
Nambour	4560	Heussler	26	73
Flaxton	4560	Ogden	19	73
Gympie	4570	Cummings	53	92
Coolum Beach	4573	Whiteoak	16	37

Queensland – other				
Suburb	P/code	Surname	No. of Weeks	No. of Species
Murgon	4605	Patterson	52	68
Scarness	4655	Coster	45	64
Woodgate	4660	Gabel	53	52
Boyne Is	4680	Ruddell	39	47
Gladstone	4680	Cowley	4	27
Gladstone	4680	Knuckey	24	36
Curtis Island	4680	Knuckey	1	17
Rockhampton	4700	MacNevin	40	32
Rockhampton	4700	MacNevin	5	21
Airley Beach	4802	Dunn	1	29
Bowen	4805	Wren	35	53
Townsville	4810	Raggatt	4	11
Garbutt	4814	Dunn	2	21
Woree	4868	England	24	39
Whitfield	4870	Magarry	49	60
Cairns	4870	Dunn	4	33
Julatten	4871	Armbrust	5	23

THE GREY GRASSWREN ON COOPER CREEK SOUTH WEST QUEENSLAND

GRAHAM CARPENTER

ABSTRACT

Two records from south west Queensland confirm the occurrence of Grey Grasswren *Amytornis barbatus* populations within the Cooper floodplain. The subspecific form as well as the size and range of the grasswren populations within this floodplain are unknown.

INTRODUCTION

The Grey Grasswren *Amytornis barbatus* is a distinctive grasswren that inhabits lignum and swamp canegrass flats on inland-flowing rivers in central Australia. Schodde & Christidis (1987) described two subspecies, *A. b. barbatus* from the Bulloo River system in south west Queensland – north west New South Wales and *A. b. diamantina* from the Diamantina (Warburton) River system in north east South Australia and south west Queensland. Records from Eyre and Cooper Creeks were also presumed by Schodde & Christidis (1987) to belong to *A. b. diamantina* but museum specimens to confirm this are lacking. Compared with *A. b. barbatus, A. b. diamantina* is larger, slightly warmer-toned above, less heavily streaked on the breast and has more broadly spaced black crescents across the throat (Schodde & Christidis 1987, Higgins *et al.* 2001).

Previous reports from the Cooper Creek system are from 5 km west of Embarka Waterhole, west of Innamincka, in South Australia (May 1982) and a breeding record from the Wilson River, Grey Range, in south west Queensland (Higgins *et al.* 2001). Reid (2000) questioned the Embarka Waterhole record, given that many ornithologists have since visited the site without further records, and that there were no reports elsewhere along the Cooper Creek. The Wilson River record was submitted to the Royal Australasian Ornithologists Union's Historical Atlas as transcriptions from the notebooks of M. Schrader, dated 16-21 August 1976. A check of the Atlas data sheets suggests that a mistake was made when the records were transcribed from the notebooks. The breeding record probably relates to observations made at Tickalara Station, since an Atlas sheet containing similar breeding information was also submitted

for this area. Tickalara Station is on the Bulloo River, a known locality of the Grey Grasswren at that time (Favaloro & McEvey 1968).

There are also reports between the Cooper and Diamantina Rivers from Lake Cudappan in south west Queensland (H. Rabig and H.B. Gill pers. comm. in Schodde 1982), although Higgins *et al.* (2001) considered the records unconfirmed.

OBSERVATIONS

The following records from Cooper Creek were made on 14 and 15 December 2001 during a one-week fauna survey for Santos Ltd of the Cooper floodplain near Ballera Gas Centre in south west Queensland.

Record 1. 60 km S Ballera Gas Centre (27^0 55' 00"; 141^0 50' 20")

A very pale small-medium sized grasswren was first seen with the naked eye at a distance of about 100 m as it perched front on at the top of a Tangled Lignum *Muehlenbeckia florulenta* (=*cunninghamii*). D. Armstrong and I subsequently heard high pitched "sit-sit-sit" calls in a line of lignum clumps (up to 3 m high and wide) along a drainage line nearby. We followed the calls for about 100 m along the drainage line before seeing any birds. Three birds were observed to within 5 m, both hopping along the ground between lignum and within the centre of lignum clumps. Black and white face and throat markings were seen clearly. After following them for about 300 m along the drainage line, one bird flushed and flew back behind us over the lignums, revealing a relatively long, broad, wedge-shaped tail.

The area comprised an extensive cracking grey clay plain with a network of small drainage lines. It was vegetated with lignum clumps (1.5 – 3 m high and wide) that were most vigorous and most closely packed along the drainage lines. Between and especially within the clumps were patches of dried, cattle-grazed vegetation up to 30 cm high including grasses, sedges (notably Spike-rush *Eleocharis* sp.) and Nardoo (*Marsilea* sp.). This growth followed an extensive flood in autumn 2000. Cattle were grazing in the area and numerous cattle pads were present.

Record 2. 17 km E Ballera Gas Centre (27^0 25' 40"; 141^0 59' 0")

Three groups of grasswrens (approximately 10 individuals in total) were located in a large expanse of dense lignum clumps along small drainage lines. The drainage lines joined a larger creek lined with River Cooba *Acacia stenophylla* approximately 1 km distant. The understorey was dense dry grasses and forbs up to 40 cm high. Singing Bushlarks (*Mirafra javanica*) were numerous, with over 100 birds observed drinking at a nearby gas-well retention pond. Cattle were present although there was little evidence of grazing and few cattle pads.

No grasswrens were found in the dense, tall (up to 5 m high) lignum that surrounded waterholes, or in areas of Queensland Bluebush *Chenopodium auricomum* shrubland at several other sites surveyed during the study.

DISCUSSION

These records confirm the presence of Grey Grasswrens within the Cooper Creek system and in the area predicted by Schodde (1982), namely the extensive floodplain of the Cooper Creek between Lake Yamma Yamma and Nockatunga Homestead in south west Queensland. These grasswren populations are nearer geographically to the Bulloo River floodplain (where *A. b. barbatus* occurs) than those of the Diamantina River floodplain, and their subspecific status remains undetermined.

It is likely that further surveys will reveal the species occurs more widely in the Cooper Creek system given the large amount of potential habitat. Reports of recent surveys in the more remote parts of the Diamantina River floodplain in Queensland (Jaensch & McFarland 2002) have shown the species there occurs more widely than previously recorded. A more concerted effort should also be made to determine the conservation status of the population near Embarka Waterhole and whether the species occurs along adjacent parts of the Cooper floodplain in South Australia.

ACKNOWLEDGEMENTS

The observations in this note were made with D. Armstrong during a fauna survey of part of the Cooper floodplain by Social and Ecological Assessments (SEA) Pty. Ltd. for Santos Ltd. Sarah Ryan, Santos, and David Wiltshire, SEA, supervised the field study. A. Silcocks of Birds Australia kindly provided copies of Atlas data sheets. R. Jaensch, G. Campbell and J. Reid made valuable comments on a draft of this article.

REFERENCES

FAVALORO, N.J. & McEVEY, A. 1968. A new species of Australian Grass-wren. *Mem. Nat. Mus. Vic.* 28: 1-9.

HIGGINS, P.J., PETER, J.M. & STEELE, W.K. (Eds) 2001. *Handbook of Australian, New Zealand & Antarctic birds. Vol. 5. Tyrant-flycatchers to Chats*. Melbourne: Oxford University Press.

JAENSCH, R. & McFARLAND, D. (2002) A population of Grey Grasswren *Amytornis barbatus* in the Diamantina Channel Country, Queensland. *Sunbird* 32 (2&3), 56-61

MAY, I. 1982. In: *Bird Notes* (Ed. B. Glover). *S. Aust. Orn. Assoc. Newsl.* 102: 11.

REID, J.R.W. 2000. *Birds of Cooper Creek and the Far North East in South Australia.* In: *Birds, Birders and Birdwatching 1899-1999*. (Eds R. Collier, J. Hatch, B. Matheson and T. Russell). Adelaide: South Australian Ornithological Association.

SCHODDE, R. 1982. *The Fairy-wrens*. Melbourne: Lansdowne.

SCHODDE, R. & CHRISTIDIS, L. 1987. Genetic differentiation and subspeciation in the Grey Grasswren *Amytornis barbatus* (Maluridae). *Emu* 87: 188-192.

SCHODDE, R. & MASON, I. J. 2000. *The directory of Australian birds. Passerines*. Canberra: CSIRO.

G. CARPENTER*, 24 Dryden Rd, Black Forest SA 5035.*
E-mail: Carpentr@arcom.com.au

A POPULATION OF GREY GRASSWREN *AMYTORNIS BARBATUS* IN THE DIAMANTINA CHANNEL COUNTRY, QUEENSLAND

ROGER JAENSCH and DAVID MCFARLAND

ABSTRACT

Between January 2001 and May 2002 Grey Grasswrens *Amytornis barbatus* were observed in extensive lignum *Muehlenbeckia florulenta* swamp at three locations on the Diamantina River floodplain in south west Queensland. Three additional records obtained in April 1984 from the same general area are reported from unpublished documents and museum specimens. These are the first published confirmed records of this species from the Diamantina Channel Country in Queensland.

INTRODUCTION

The Grey Grasswren *Amytornis barbatus* has a disjunct distribution within the Channel Country biogeographical region (Environment Australia 2002) with two described subspecies—*barbatus* in the Bulloo River system and *diamantina* in the Diamantina and Georgina River systems (Schodde and Mason 2000). Nationally, the restricted range of the Grey Grasswren is recognised by *A. b. barbatus* and *A. b. diamantina* being assigned the conservation status of Vulnerable, and Least Concern, respectively (Garnett & Crowley 2000). Queensland legislation (*Nature Conservation Act 1992*) lists the species as Rare.

Recent observations by Carpenter (2002) have extended the known range of the Grey Grasswren to the main floodplain of the Cooper Creek in Queensland. An earlier record from the Wilson River (Higgins *et al.* 2001), a Cooper Creek tributary, is considered by Carpenter (2002) to be an incorrectly transcribed Bulloo record and a reported Cooper Creek population in South Australia is unconfirmed (Higgins *et al.* 2001). The subspecific status of populations within the Cooper Creek floodplain has not been determined.

Populations of the species in the Diamantina and Georgina River systems at Goyder's Lagoon in South Australia and on Eyre Creek in Queensland are known from published reports (Joseph 1982, Higgins *et al.* 2001) and observations (J. Reid unpublished data, R. Jaensch pers. obs.). In the

Queensland part of the Diamantina system published confirmed records are absent and there is one unconfirmed record from Farrars Creek (Higgins *et al.* 2001), a major Diamantina tributary. Consequently neither Schodde and Mason (2000) nor Higgins *et al.* (2001) indicate the Diamantina population extending into Queensland.

During 2000-2002, RJ conducted ground surveys of waterbirds in several parts of the Channel Country. This provided an opportunity to record other birds in wetland habitats and some attention was given to species known to be rare or of uncertain distribution. We present information on Grey Grasswrens observed by RJ in the Queensland part of the Diamantina floodplain and draw attention to the existence of earlier unpublished records and specimens from this area.

OBSERVATIONS

January 2001

Between 1540 h and 1700 h on 12 January 2001 RJ observed at least six Grey Grasswrens in lignum *Muehlenbeckia florulenta* swamp on the Diamantina floodplain (25° 41.60' S, 140° 16.27' E). The swamp was part of an extensive wetland area (*ca* 50 000 ha) fed by terminating minor channels of the Diamantina River and apparently also by unconfined flow from the Farrars and/or Browns Creek systems. A small flood had passed through the wetland a few weeks earlier and a second minor flood was approaching. At this locality on 12 January the swamp was inundated (up to 0.3m deep) and the water level was rising.

Grey Grasswrens were seen at the outer edge of the lignum swamp and up to 150m inside the swamp, which was the limit of survey. Individual lignum shrubs were up to 2.2m tall and 2-3m in diameter and generally not as dense as specimens can become. Shrubs were 3-10m apart. Denser stands occurred along a minor drainage line about 200m farther inside the swamp. Many shrubs had fresh leaves but others were bare and possibly had been burnt since the last flood season. The understorey was continuous, dense, lush spike-rush *Eleocharis plana* with emerging channel millet *Echinochloa turnerana*, budda pea *Aeschynomene indica* and sedges *Cyperus* spp. No trees were present in the swamp.

The grasswrens were identified by their diagnostic black and white facial marks and a V-shaped mark between the throat and ear coverts. They were light tawny

brown dorsally with prominent white streaks on their necks and upper wing coverts. They were larger in size and had larger tails than White-winged Fairy-wrens *Malurus leucopterus* and Variegated Fairy-wrens *M. lamberti* that were sometimes present in the same shrubs. The grasswrens had stronger, more strident and penetrating calls than the fairy-wrens.

At about 1330 h on 15 January 2001 two Grey Grasswrens were seen and a third was heard in sparse isolated lignum shrubs lacking vigour at a location 9km ESE (25° 43.70' S, 140° 20.70' E). Some patches of tall dense swamp canegrass *Eragrostis australasica* were nearby. Trees were absent and ground cover was limited to sparse forbs. The site was about 30m inside the Diamantina floodplain in an area of transitional wetland on hard brown clay, rather than the deep-cracking grey clay that dominated the inner floodplain. Traces of water persisted on the ground but the site was approximately 500m from fresh floodwater coming from minor channels.

May 2002

At 1230 h on 10 May 2002 RJ and Jason Chevasse observed seven Grey Grasswrens at a location (25° 38.85' S, 140° 14.38' E) 6km NNW of the sighting of 12 January 2001. The birds were 30m from the bank of a large, partly full, semi-permanent waterhole and 20m inside the outer, upland edge of dry lignum swamp. The swamp had partially filled several months earlier. Lignum shrubs were 1.5 to 2.0m tall and spaced 0 to 5m apart. The intervening dry mud supported almost no vegetation. Trees were present only on the bank, which was slightly higher in elevation than the swamp.

EARLIER RECORDS AND SPECIMENS

In an unpublished review of fauna records in the Queensland part of the Channel Country (McFarland 1992) the occurrence of the Grey Grasswren is mapped on several ten-minute grid blocks in the Diamantina floodplain. Details of two records were extracted from a report of fauna surveys for Diamantina Shire conducted in April 1984 (Atherton *et al.* undated).

The first record of three birds seen on 14 April 1984 was from a five-minute grid block (centred at 25° 42.50' S, 140° 37.50' E) that was at least 24km E of the most easterly sighting from 2001. The block included narrow waterholes on alluvial plain at the flood-out of Browns Creek. Vegetation in the block, some of

which was occupied by the grasswrens, comprised sparse low shrubs including chenopods, sparse low tussock grass and wooded channels.

The Queensland Museum collection contains two spirit specimens from this block: (1) specimen QMO.22665 from a waterhole (25° 42' S, 140° 37' E) on 14 April 1984; and (2) specimen QMO.22670 from a channel (25° 41 S, 140° 40' E) on 20 April 1984. We assume that these specimens were collected during the Shire survey. The two localities are about 5km apart.

The second record of two birds seen on 20 April 1984 was from a five-minute grid block (centred at 25° 37.50' S, 140° 17.50' E) that was at least 1.5 km E of the 2002 sighting. The block included alluvial plain and channels of the Diamantina River. Vegetation in the block, some of which was occupied by the grasswrens, comprised mid-dense tussock grass, sparse bluebush (probably *Chenopodium auricomum*) and isolated trees. Due to the coincidence of dates it is possible that specimen (2) may refer to this second record, rather than the first.

CONCLUSIONS

The data presented confirm the existence of a population of Grey Grasswren on the middle reaches of the Diamantina River system in Queensland. They constitute five or six records in two clusters with 43 km separating the most westerly and easterly records. Further survey work might reveal the actual range of the population. The nearest named channel of Farrars Creek is only 27 km to the north-east of these records and the unconfirmed record mentioned by Higgins *et al.* (2001) may refer to the same population.

Higgins *et al.* (2001) identify lignum as being a common feature of Grey Grasswren habitat and our investigations support that view. Lignum shrubland occurs widely, though often sparsely, over a large area of this part of the Diamantina floodplain but is less extensive between these middle reaches and Goyder's Lagoon. The present records, those of Carpenter (2002), and remarks made to RJ by some property managers suggest that the species may be widespread in the Channel Country. Most of the larger areas of lignum swamp in Queensland have not been searched systematically for this species.

Joseph (1982) reported the species living in Eyre Creek in the largest and most dense stands of lignum. On the Diamantina RJ found the species in lignum that was sometimes both sparse and marginal, as did Julian Reid (pers. comm.) at Goyder's Lagoon. On the Eyre Creek floodplain on 19 April 2001 RJ observed the species in lignum shrubs of moderate height (typically 1.5m), with variable spacing between shrubs. Massive dense lignum was absent but occurred along the main channel of Eyre Creek. In RJ's experience the grasswren tends to be absent from lignum shrubland where emergent trees form a continuous or scattered overstorey

We know of no immediate threats to the viability of the Diamantina population in Queensland. Lightning sometimes ignites lignum swamps and some property managers burn lignum swamps to enhance pasture growth and to facilitate cattle mustering. A possible threat is the impact on the species of the frequency of fires in the lignum. The long-term effect of current burning regimes on lignum communities is not known and should be investigated to show how the floodplains can be grazed and their unique biodiversity can be protected.

ACKNOWLEDGMENTS

Wetlands International and the ARIDFLO project (South Australian Department of Water, Land and Biodiversity Conservation with funds from the Natural Heritage Trust) funded fieldwork by RJ. The Queensland Herbarium (Environmental Protection Agency) and Department of Natural Resources and Mines provided field assistants Kathy Stephens (botanist) and Jason Chevasse and vehicles. Dr. Andrew Amey provided details of specimens held in the Queensland Museum collection. For information and cooperation over access to pastoral leases we thank Derek Trapp, Jon Cobb and Greg Campbell. Greg Campbell, Michael Good, Julian Reid and Graham Carpenter provided helpful comments on this article.

REFERENCES

ATHERTON, R.G., GORDON, G., PORTER, G. & REIMER, D.S. Undated. Fauna Survey of the Diamantina Shire, South West Queensland. Queensland NPWS. (Unpublished).

CARPENTER, G.A. 2002. The Grey Grasswren on Cooper Creek - South West Queensland. *Sunbird* 32 (2&3), 52-55

ENVIRONMENT AUSTRALIA 2002. Interim Biogeographic Regionalisation for Australia Version 5.1; Queensland. [Online], http://www.ea.gov.au/parks/nrs/ibraimcr/ibra_95/ibra_v5/ibrastate/qld.html, 26 July 2002.

GARNETT, S.T. & CROWLEY, G.M. 2000. *The Action Plan for Australian Birds*. Canberra: Environment Australia.

HIGGINS, P.J., PETER, J.M. & STEELE, W.K. (Eds.) 2001. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 5: Tyrant-flycatchers to Chats*. Melbourne: Oxford University Press.

JOSEPH, L. 1982. A further population of the Grey Grasswren. *Sunbird* 12: 51-53.

MCFARLAND, D. 1992. Fauna of the Channel Country biogeographic region, south west Queensland. Queensland NPWS. (Unpublished)

SCHODDE, R. & MASON, I.J. 2000. *The directory of Australian birds. Passerines*. Canberra: CSIRO.

ROGER JAENSCH, *Wetlands International, c/- Queensland Herbarium, Mt Coot-tha Road, Toowong Q 4066.*

DAVID McFARLAND, *15 Currong St, Kenmore Q 4069.*

WHY DO MALE FAIRY GERYGONES *GERYGONE PALPEBROSA* BURST INTO SONG ON HEARING PREDATORS OR LOUD NOISES?

STEPHEN MURPHY

ABSTRACT

Birds rarely draw attention to themselves by singing immediately after hearing a predator call. Playback experiments and anecdotal observations show that some male, but not female, Fairy Gerygone *Gerygone palpebrosa* at Iron Range National Park produce a particularly loud song immediately after hearing predator calls (eg Black Butcherbird *Cracticus quoyi*) or loud noises. This song was recorded and compared with a similar song described (as "type II") by Langmore & Mulder (1992) only produced by males of some Fairy-wren species. These male songs seem homologous in both structure and function and may be part of mating behaviour in these species.

INTRODUCTION

Normal alarm calls of most birds in the presence of predators are short and uncomplicated. In certain males of the Superb Fairy-Wren *Malurus cyaneus* (Langmore & Mulder 1992) and Splendid Fairy-Wren *M. splendens* (Zelano *et al.* 2001) the call of a predator elicits a unique song (called a "type II" call). As an alarm call this song seems inefficient because it is complex and energetically costly to produce. Sometimes when broadcasting the call males also position themselves in exposed situations such as the tops of small bushes (Langmore & Mulder 1992; Zelano *et al.* 2001; personal observations) where they can be easily seen by the predator.

Because females do not use the type II call Langmore & Mulder (1992) propose that in *M. cyaneus* it may form a part of the species unusual mating system. The authors suggest that neighbouring female *M. cyaneus* may decide to offer extra-pair paternity to a male who they believe to be of very high quality based on his ability to sing in dangerous circumstances. Unsatisfied with the male quality hypothesis alone as an explanation for this unusual behaviour in *M. splendens* Zelano *et al.* (2001) suggest that such males indirectly benefit by drawing the attention of a predator upon themselves and away from their mates.

Here I report an apparently homologous 'type II' call in male Fairy Gerygone observed while conducting other field-work within and around Iron Range National Park, Queensland (12°45'S, 143°17'E). The Fairy Gerygone is a sub-tropical to tropical member of the family Pardalotidae inhabiting rainforests, adjacent woodlands, and mangroves (Simpson & Day 1993; personal observations). Apart from its unusual habit of nest building near active wasp nests little is known about the species reproductive biology or mating systems (Serventy 1982).

METHODS

Observations and playback experiments were carried out within and around Iron Range National Park where a dense population of Fairy Gerygone lives in a diverse mosaic of lowland tropical rainforest and tropical savannah. Playback experiments using a taped call of the Black Butcherbird *Cracticus quoyi* were conducted to observe the behaviour of Fairy Gerygone. Individual birds were located with binoculars and observed whilst using the recorded playback tape and opportunistically after hearing a range of other sounds (see Table 1). The sex and the behaviour of individuals were recorded.

A Sennheiser directional microphone and a Sony Professional tape recorder were used to record sound. The type II calls (see Fig. 1) were graphically analysed with Canary 1.2 software (Charif *et al.* 1995). The type II call of *M. cyaneus* was recorded at the Australian National Botanic Gardens in Canberra.

RESULTS

On five occasions when individual male Fairy Gerygones were observed to respond to predator calls (prior to play-back experiments) each gave a type-II call. On three occasions, individual females were observed and exposed to playback tapes of a predator call but none gave the type-II call. This result is statistically significant ($c^2 = 10.6$; $p = 0.001$) and suggests that only male Fairy Gerygones give the type II call.

Each time observed males responded they would stop what they were doing, stand upright and give the call. They did not fly to a prominent perch in order to sing (cf. *M. cyaneus*). On one occasion two males were chasing one another in the presence of a female. When the playback tape was heard the male who was chasing immediately stopped, adopted the up-right posture and gave the type-II call.

Figure 1 compares the type II calls of Fairy Gerygone and *M. cyaneus*. Fairy Gerygones frequently responded to sounds other than Black Butcherbird calls. Table 1 presents a qualitative description of frequently heard sounds in Fairy Gerygone habitat and how often each sound elicits the type II call.

DISCUSSION

The type II calls observed in Fairy Gerygones have several features in common with those reported for Fairy-wrens (Langmore & Mulder 1992; Zelano *et al.* 2001). Only certain males produce the call in a particular context, their response is instantaneous and the song is characterised by two distinct

Table 1: The relative frequencies; of sounds heard in the habitat and; of the type II call responses from male Fairy Gerygones.

Sound source	Qualitative frequency that sound is heard	Qualitative frequency that sound elicits type II call *
Black Butcherbird	frequent	frequent
dingo (howl)	infrequent	frequent
domestic dog (bark)	infrequent	frequent
Magnificent Riflebird *Ptiloris magnificus*	very frequent	moderately frequent
Channel-billed Cuckoo *Scythrops novaehollandiae*	infrequent	moderately frequent
thunder	frequent	moderately frequent
tree fall	infrequent	moderately frequent
Human speech	frequent	moderately frequent
Pheasant Coucal *Centropus phasianinus*	frequent	infrequent
White-browed Robin *Poecilodryas superciliosa* (harsh 'botta-chew' call)	frequent	rarely
Spangled Drongo *Dicrurus hottentotus* (alarm call)	frequent	rarely
Common Koel *Eudynamys scolopacea*	frequent	rarely
*** (taking into account the frequency that the sound is heard)**		

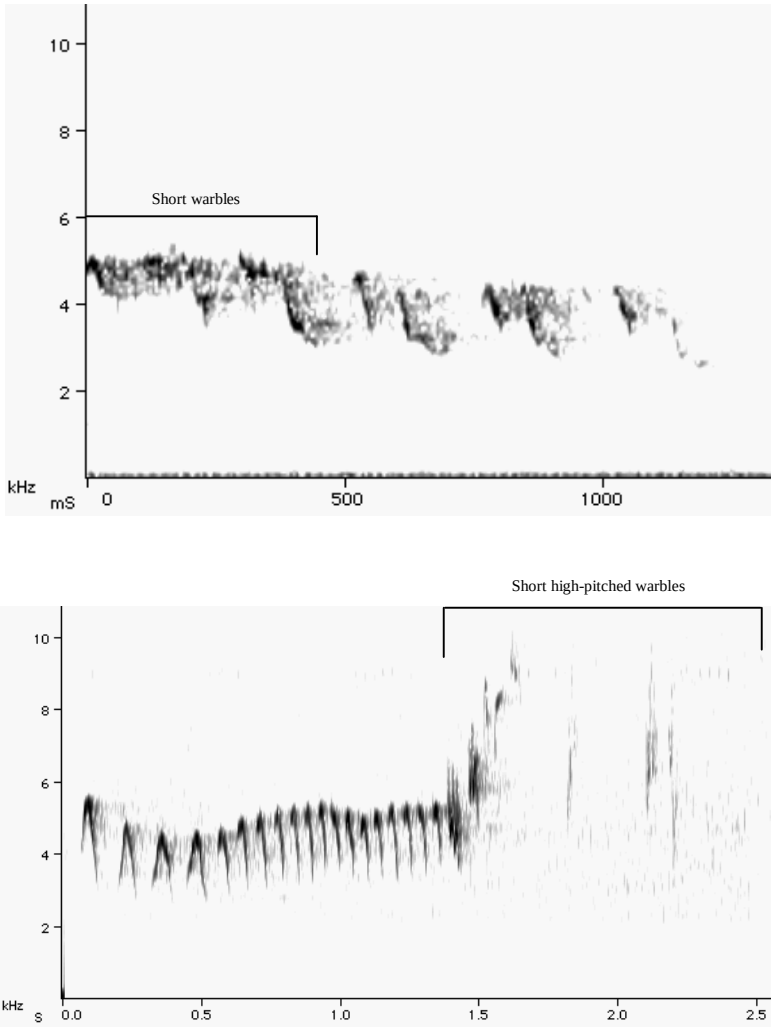

Fig. 1: Spectrograms illustrating the type II calls of Fairy Gerygone (above) and Superb Fairy-Wren (below)

parts. One part consists of loud, widely spaced notes, and the other, more variable in length, is a series of shorter warbles. The order of these parts is reversed in the Fairy Gerygone type II call compared with the *M. cyaneus* type II call (Fig. 1).

In Fairy Gerygone the sound context that most frequently prompts a type II response is the call of the Black Butcherbird, possibly the main predator of the species in the study area. The sound that elicits the type II call most frequently for *M. cyaneus* and for *M. splendens* are the calls of their predators Pied Currawongs *Strepera graculina* and Ravens *Corvus* spp. (Langmore & Mulder 1992) and Grey Butcherbirds *Cracticus torquatus* (Zelano *et al.* 2001) respectively. Like Fairy-wrens, Fairy Gerygones also gave the type II call in response to sounds made by potential predators, non-predators, and inanimate sounds (see Table 1).

In Fairy-wrens the type II call is considered to be part of their unusual mating systems which involve group living and high incidences of extra-pair and extra -group young (Langmore & Mulder 1992; Zelano *et al.* 2001). The type II call of Fairy Gerygones could also have a mating system function but until their mating system is better understood this unusual song is likely to remain unexplained.

REFERENCES

CHARIF, R.A., MITCHELL, S. & CLARK, C.W. 1995. *Canary 1.2 User's Manual.* Cornell Laboratory of Ornithology, Ithaca, New York.

LANGMORE, N. & MULDER, R. 1992. A novel context for Bird song: Predator calls prompt male singing in the kleptogamous Superb Fairy-Wren *Malurus cyaneus*. *Ethology* 90:143-153.

SERVENTY, V.1982. *The Wrens and Warblers of Australia.* Angus and Robertson, Sydney.

SIMPSON, K. & DAY, N. 1993. *Field guide to the birds of Australia*. Viking O'Neil, Victoria.

ZELANO, B., TARVIN, K.A. & PRUETT-JONES, S. 2001. Singing in the face of danger: The anomalous type II vocalisation of the Splendid Fairy-Wren. *Ethology* 107:201-216.

STEPHEN MURPHY
School of Botany and Zoology

BOOK REVIEW

Canberra Birds: a report on the first 18 years of the garden bird survey by Philip A. Veerman. 2002. Privately Published by P.A. Veerman, 24 Castley Circuit, Kambah ACT.

The garden birds of Canberra must be the best studied in Australia as a result of this ongoing garden bird survey that started in 1981. Apart from a series of reports appearing in local newsletters, in the last two years there have been two publications that summarise the major results of the survey. The first was a glossy publication, "Birds of Canberra Gardens", produced by the Canberra Ornithologists Group in 2000 and reviewed in a Birds Queensland newsletter. Now there is a more detailed and technical treatment of the survey with the publication of a book under consideration.

Philip Veerman got his first taste of garden bird surveys (GBS) participating in the Queensland Ornithological Society's GBS in 1979/80 when he livied in Coorparoo, Brisbane. A few years later he moved to Canberra and participated in their GBS. He took on the computerization and analysis of the data which led to the publication of this comprehensive report.

His 2002 report starts with a review of other garden bird surveys both in Australia and overseas. This provides a context for the Canberra survey and is followed by a history of bird surveys in Canberra, including their Atlas and Bird Reports and leads on to the start of the GBS. Its origin, covering the different versions of the GBS annual charts and the instructions that were supplied with them is described in detail. This includes the methods used to analyse these data from the initial crude "cut and paste" methods to the subsequent use of computer databases.

The results section is over 40 pages long containing graphs showing various measures of participation in the survey and seasonal changes in the number of species recorded and the abundance of all birds. Then follows some interesting graphs on the cumulative numbers of species recorded. This indicates that even after 18 years of records new species are still being added. A total of 218 species were recorded but only 94 were recorded every year of the survey. Breeding records and the effects of observer effort on other parameters are analysed. An interesting analysis compares the relationship between species abundance (A) and recording rate (R%), which may be of use in other surveys. The conservation significance of these results is considered, including the impact of exotic species and the importance of the suburban habitat.

There are 50 pages of species accounts and 15 pages of seasonal and annual graphs for most of the species. This is the real "meat" of the report and it is the section that will be most heavily used by ornithologists. The species accounts and the groups of species have a few lines of introductory text, in some cases of a very general nature. These are followed by more specific and valuable comments on notable aspects of seasonal or annual variation, migration and breeding. The seasonal graphs are presented as histograms that generally show quite clearly whether there is seasonal variation or not. Annual variation is shown by line graphs and linear regression lines are fitted to some of these graphs but there is no indication of whether the regressions are significant. In some cases the trends do appear linear but in other cases some other form of statistical analysis would probably have been more appropriate. There is clearly scope for further work in this area and probably some key species should be selected for more intensive study.

Finally there are 8 Appendices giving summary data for each species, breeding records, the sites and contributors, etc. followed by a list of references and the index.

The interesting and exciting part of these surveys is in watching the birds and collecting the field data but, over a period, the initial enthusiasm for doing this can easily wane. The Canberra Ornithologists Group must be commended for gathering a large band of dedicated observers who continued to make records of their garden birds over many years. This has provided a huge and valuable database of information.

However, in all these projects, much hard work is in the data entry, analysis and writing. Here Philip Veerman has made a major contribution. He has invested an extraordinary amount of time and effort in this project for which he should be congratulated. For some of this period he was unemployed, so "the dole" can be acknowledged as a funding body! In the end he published this report privately and thus made this large body of information available to interested researchers.

Of the two reports now available on this survey, the casual birder will probably be satisfied with the glossy publication "Birds of Canberra Gardens" but anyone with a deeper interest in birds, their populations and variability will need to get this report. It will also provide very useful background information for anyone considering starting up a similar survey elsewhere.

PETER WOODALL, *School of Veterinary Science,*
The University of Queensland, Brisbane, Q. 4072.