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# THE SUNBIRD

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## **SURVEYS OF TERRESTRIAL BIRDS IN THE BRISBANE VALLEY, 1981-2004**

ALAN DANSON, GRAHAM PALMER, RICHARD THOMSON, JIM THORNTON  
AND PETER F. WOODALL

### **ABSTRACT**

Birds were counted annually during roadside surveys conducted in October across the Brisbane Valley over the same (176km) route for a period of 24 years from 1981 to 2004. Over this period 56 and 161 species, respectively, were recorded in aquatic and terrestrial habitats. The terrestrial species included 30 (18.6%) that were recorded annually and 18 (11.2%) that were recorded only once. The ten most abundant species (Common Starling; Torresian Crow; Fairy Martin; Australian Magpie; Masked Lapwing; Magpie-lark; Galah; Cockatiel; Common Myna and Scaly-breasted Lorikeet) were often recorded in open pasture, by far the most common type of habitat represented along the survey route.

An analysis of the numbers of individuals recorded for the 161 terrestrial species in six, 4-year time periods suggests that the abundances of 124 (77.0%) species did not change significantly over the 24-year period. Amongst the remainder, 24 (14.9%) species demonstrated significant increases in abundance, 10 (6.2%) species demonstrated significant decreases in abundance and 3 (1.9%) showed significant variability in abundance, with minima in the 1989-1996 period when there were a series of very dry years. Possible reasons for some of these changes are discussed.

The results of this survey are compared with other surveys conducted nearby, in urban and suburban habitats (mainly from Greater Brisbane) and across Australia as a whole. Many of the 24 species that increased in abundance during this survey also increased in abundance throughout their Australian ranges over the same period.

## INTRODUCTION

In south-east Queensland there is a projected annual increase of 50,000 people a year (Anon 2004), which is increasing pressure on the natural environment. The Brisbane Valley has experienced a rapid increase in population over the last 20 years that is likely to continue. From 1981 to 2001 the population of Esk Shire increased by 73.4% (from 8,090 to 14,029) (C-Lib91 1994; Australian Bureau of Statistics 2005) and this has led to a comparable increase in residential dwellings, often on large blocks of land. In 1993-1994 commercial agriculture occupied 65% of the shire area and the balance was in forestry and water reserves, parks and nature reserves and urban areas. The agricultural area was mainly native pasture (94%) with the remainder being sown pasture and crops (Australian Bureau of Statistics 1995).

Baseline surveys to document the bird species and populations in this area, so that changes can be monitored, are important. This project had two aims, to establish the bird species in the area covered by the route and to monitor any long term changes in bird abundance. Bibby *et. al.* (1992) state that the most important point about population monitoring "is not that the methods be accurate but that they be similar from year to year so that systematic inaccuracy does not have an adverse effect". We have kept the survey method as constant as possible, maintaining the same route and the same regular stops each year.

There is no comprehensive list of bird species published for the Brisbane Valley. Some bird lists are published for localities in or near the Brisbane Valley, including Murphy's Creek (Lord 1956) to the west, Marburg District (Leach & Hines 1987) to the south, and for the broader region of south-east Queensland (Roberts 1979). These papers are largely qualitative, although Leach and Hines (1987, 1993) do give the percentage frequency of species. Leach and Recher (1993) performed limited bird counts from roadsides and remnant softwood scrub near Marburg that yielded 43 and 48 species, respectively.

The current survey originated from the Annual Bird Counts initiated by the Queensland Ornithological Society (now Birds Queensland) first held in January 1972 (Anon 1972). Subsequent annual counts took place in October (Dawson & Perkins 1972). Methods used in the Annual Bird Counts (Perkins 1975) changed in 1983 (Anon 1984).

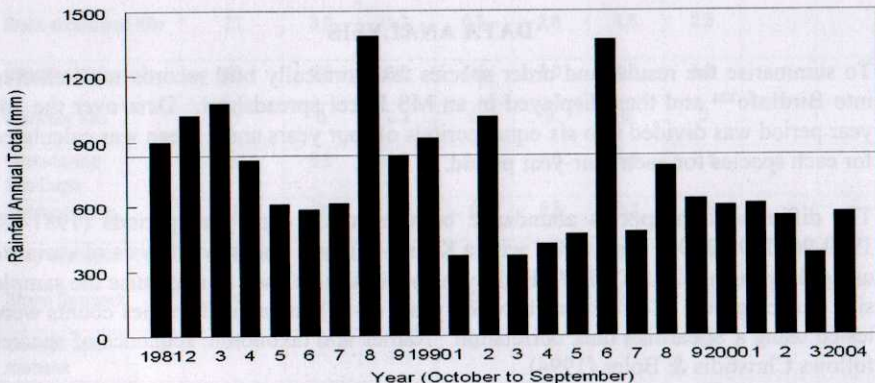
In the 1970's the boundaries of Area 8 (Brisbane Valley) extended from Murilea in the south-east to Toogoolawah in the north-west (Perkins 1975) and, at times, more than one team of observers was engaged in counting birds in this area. In 1980, a single team counted in a reduced area and the route was slightly modified in 1981 and, from then onwards, a count was regularly performed by one team following the same route to monitor any long term changes in species and their abundances. This paper reports the results of 24 years of bird counts for only terrestrial species. Although waterbirds were included in the surveys they will be the focus of a subsequent paper.

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### LOCATION, CLIMATE & SURVEY METHOD

The 176 km survey route lies mainly within the local government Shire of Esk. Full details of the survey route and of the locations of regular stops are given in Appendix I. The survey begins at Minden Primary School just after dawn, continues to Atkinson's Dam for breakfast, then on to Seven-mile Lagoon and then through Coominya to Esk. We drive to Deongwar State Forest for lunch and then return to Wivenhoe Dam, on to Splityard Creek Dam and finish at Kipper Creek Road at dusk.

Annual rainfall records (Figure 1) from Gatton (located 23 km SW of the study area) were obtained (Anon. 1980-2004) and calculated from October to September preceding the bird count, since it is rainfall over this time that would most influence bird breeding success and survival. Data for April, May and June 1999 were not available for Gatton and the corresponding data for Amberley have been substituted. The annual rainfall (Fig. 1) has been quite variable. In the first 8-year period (1981-1988), four years had above average rains and four below average rains, and the average for this period (876 mm) was slightly higher than the long term (1961-1990) average 839 mm. The middle 8-year period (1989-1996) had three years with above average and five years with below average rains and the average for this period (720 mm) was below the long term average due to some very dry years (1991 and 1993). In the last 8-year period (1997-2004) all years were below average and the average for this period (576 mm) was well below the long term average. Thus there has been a general trend of declining rainfall over the course of this survey.



**Fig. 1. Annual rainfall (October to September) for Gatton during the survey (mean = 839 mm.)**

The number of participating observers each year was usually five to six (average of 5.5, range 3 – 7). Of the authors, three contributed to > 90%, and two to > 70% of the annual counts. Other regular observers were Ron Dowling, Ashley Pyle and Leith Woodall. Observers used binoculars and telescopes were used at the large water bodies (see Appendix 1, Stops 3, 6, 7, 8, and 12). Observers moved as one group, although individuals would sometimes move a short distance (<100m) from the group. All birds seen or heard, irrespective of distance from the observers, were recorded both at the stops and while driving between them. We tried to avoid counting the same birds twice, particularly where our route involved doubling back on the same road (56 km), where we only recorded new species for that section. Of the 121 km of “first travelled route” where all species were recorded, an estimated 52% was cleared pasture or cultivation, 40% was woodland or forest and 8% was houses and their gardens. Stops were also made at 8 water bodies located in open pasture or arable land. This open habitat also provided the greatest visibility over long distances, and is the most representative habitat.

In addition to the regular stops, brief stops were made to observe unusual species or to count particularly large concentrations of birds. When water bodies like Atkinson’s Dam and Seven Mile Lagoon were full, more time would be spent observing them than when they were empty. Each year the same period of time (dawn to dusk) was spent on the survey and the same route was followed. The weather conditions have been fairly uniform for the surveys. During the 1985 survey it rained in the morning but had cleared by the afternoon. The observer team was fairly constant in numbers and ability each year; although in years when Ashley Pyle was present his ability to identify bird calls resulted in some additional species being recorded. However, this would not have affected the general counts of common species.

### DATA ANALYSIS

To summarise the results and order species taxonomically bird records were entered into BirdInfo™ and then displayed in an MS Excel spreadsheet. Data over the 24-year period was divided into six equal periods of four years and a mean was calculated for each species for each four-year period.

The differences in species abundance between three eight-year periods (1981-88, 1989-96, 1997-2004) were tested with a Krusal-Wallace one-way analysis of variance using the program XLSTAT™. Eight-year periods were used to maximise the sample size in each group. Correlations between years (1-24) and annual species counts were tested using a Spearman rank correlation. Names and taxonomic sequence of species follows Christidis & Boles (1994).

### RESULTS

Over the 24-year period a total of 217 species of birds were recorded in October during these surveys in the Brisbane Valley. Fifty-six species were recorded in aquatic habitats and these records will be discussed further elsewhere.

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Of the 161 terrestrial species, 30 were recorded on all 24 counts while 18 species were recorded on only one occasion (Table 1).

The species with the highest recorded abundances were Common Starling (1233), Torresian Crow (1113), Fairy Martin (1076), Australian Magpie (894), Masked Lapwing (874), Magpie-lark (860), Galah (788), Cockatiel (740), Common Myna (616), and Sealy-breasted Lorikeet (612).

In 37 species the analysis of the data showed that the numbers birds counted significantly changed over the survey period (Table 1, Fig. 2): 24 species, increased in abundance, 10 species declined and 3 showed a variable pattern.

**Table 1. Terrestrial birds recorded during Brisbane Valley bird counts.**

See p.11 for key to symbols used in Table 1

Species	NC (/24) <sup>a</sup>	Mean Number Counted per Year						Significance	
		1981 1984	1985 1988	1989 1992	1993 1996	1997 2000	2001 2004	K-W <sup>b</sup>	S <sup>c</sup>
Australian Brush-turkey	2	0	0	0.8	0	0	0		
Brown Quail	8	0.5	0.3	1.8	1.0	1.0	0.3		
Osprey	2	0.3	0	0	0	0	0.3		
Pacific Baza	12	2.0	0.8	0.5	1.3	3.0	0.8		
Black-shouldered Kite	21	3.0	1.3	0.5	2.8	1.5	2.8		
Whistling Kite	23	6.3	6.5	7.5	3.0	4.5	4.3		
Brahminy Kite	1	0	0.3	0	0	0	0		
White-bellied Sea-Eagle	15	0.5	2.3	0.3	1.0	1.5	2.3		
Swamp Harrier	5	0	0.3	0	0.3	0.3	0.5		
Grey Goshawk	6	0.5	0.3	0.3	0.3	0.3	0.3		
Brown Goshawk	4	0.3	0	0	0	0.3	0.5		
Collared Sparrowhawk	1	0	0	0	0	0	0.5		
Wedge-tailed Eagle	17	1.5	1.5	2.5	1.3	2	2.75		
Brown Falcon	16	1.3	0.5	1.5	1.0	0.8	1.3		
Australian Hobby	8	0	0.3	0.8	0.3	0.5	0.5		
Black Falcon	2	0	0	0	0	0	0.8		



Species	NC (24) <sup>a</sup>	Mean number counted per Year						Significance	
		1981 - 1984	1985 - 1988	1989 - 1992	1993 - 1996	1997 - 2000	2001 - 2004	K-W <sup>b</sup>	S <sup>c</sup>
Peregrine Falcon	1	0	0	0.3	0	0	0		
<b>Nankeen Kestrel</b>	24	23	12.8	11.0	7.3	12.3	11.8	*	
Painted Button-quail	2	0	0	5.3	0	0	0		
Bush Stone-curlew	1	0	0	0	0	0	0.3		
Banded Lapwing	10	3.0	2.0	3.0	5.0	1.8	0		
Masked Lapwing	24	26.5	43.3	35.0	29.5	30.5	47.0		
Rock Dove	24	13.3	24.3	42.0	17.0	12.5	15.3		
<b>Spotted Turtle-Dove</b>	23	3.3	2.0	2.0	3.8	6.0	7.5	*	*
Brown Cuckoo-Dove	19	0.3	7.3	3.8	1.8	2.5	4.3		
<b>Emerald Dove</b>	4	0	0	2.3	0	0	0.8		*
Common Bronzewing	12	2.0	1.0	0.5	0.3	1.0	0.5		
<b>Crested Pigeon</b>	24	18.5	19.5	23.3	22.0	29.8	33.5	*	*
Peaceful Dove	24	5.0	4.0	3.0	4.3	5.5	3.3		
Bar-shouldered Dove	23	5.3	5.8	3.8	3.3	5.0	3.8		
Wonga Pigeon	15	0.5	1.5	1.0	1.5	0.5	0.8		
Topknot Pigeon	1	0	0	0	0	0.3	0		
Yellow-tailed Black-Cockatoo	1	0	0	0	0	0	0.5		
Galah	24	23.8	32.8	34.0	27.5	43.3	35.8		
<b>Long-billed Corella</b>	4	0	0	0	0	5.3	11.3	*	*
<b>Little Corella</b>	4	0	0	0	0	4.5	10.8	*	**
Sulphur-crested Cockatoo	17	4.5	3.0	1.0	2.0	1.0	1.0		
<b>Cockatiel</b>	24	11.8	60.0	57.8	37.5	10.0	8.0	*	*
<b>Rainbow Lorikeet</b>	22	7.8	17.3	7.8	6.8	19.8	26.5	*	**
Scaly-breasted Lorikeet	24	23.5	35.5	17.0	22.0	15.8	39.3		
Little Lorikeet	12	2.0	6.8	1.0	2.5	0	0.8		
<b>Australian King-Parrot</b>	18	0.8	2.8	1.8	1.3	3.3	4.8	*	*

Species	NC (/24) <sup>a</sup>	Mean Number Counted per Year						Significance	
		1981 - 1984	1985 - 1988	1989 - 1992	1993 - 1996	1997 - 2000	2001 - 2004	K-W <sup>b</sup>	S <sup>c</sup>
Crimson Rosella	12	2.0	0.5	2.0	0.3	1.5	1.3		
Pale-headed Rosella	24	17.5	20.0	18.0	10.3	15.5	23.5		
Red-rumped Parrot	5	0.5	0.5	1.0	0	0.8	0		
Pallid Cuckoo	6	1.0	0.3	0	0	0.3	1.0		
Brush Cuckoo	5	0	0.5	0.5	0	0.3	0.3		
Fan-tailed Cuckoo	13	0	1.5	0.8	0.8	1.3	0		
<b>Horsfield's Bronze-Cuckoo</b>	5	0.5	0.3	0.5	0	0	0		**
Shining Bronze- Cuckoo	5	0.3	0	0	0.5	0.8	0		
Little Bronze-Cuckoo	2	0	0	0	0	0.3	0.3		
Common Koel	21	2.3	3.8	4.8	3.3	2.3	1.3		
Channel-billed Cuckoo	21	1.3	2.5	2.0	2.8	2.3	4		
Pheasant Coucal	24	3.3	6.0	4.0	3.0	3.3	3.5		
Southern Boobook	1	0	0	0.3	0	0	0		
Barn Owl	1	0	0	0.3	0	0	0		
Tawny Frogmouth	2	0	0	0.5	0	0	0		
White-throated Nighthjar	4	0	0	0.3	0	0.5	0.3		
White-throated Needletail	10	3.0	1.8	2.0	0.8	3.8	0.3		
Fork-tailed Swift	1	0	0	0	1	0	0		
Azure Kingfisher	4	0.3	0.8	0	0	0.3	0		
Laughing Kookaburra	24	13.0	13.0	11.3	8.5	12.8	12.8		
Red-backed Kingfisher	1	0.3	0	0	0	0	0		
Sacred Kingfisher	24	8.8	9.0	8.5	5.5	10.3	6.3		
<b>Rainbow Bee-eater</b>	23	13.8	9.3	4.8	4.0	9.3	2.5	**	**
Dollarbird	24	6.0	15.8	11.3	6.5	11.0	5.8		
Noisy Pitta	2	0	0.3	0.5	0	0	0		
<b>White-throated Treecreeper</b>	16	0.3	0.5	0.5	1.0	2.3	1.5	*	

Species	NC (/24) <sup>a</sup>	Mean number counted per Year						Significance	
		1981 - 1984	1985 - 1988	1989 - 1992	1993 - 1996	1997 - 2000	2001 - 2004	K-W <sup>b</sup>	S <sup>c</sup>
Superb Fairy-wren	23	3.5	4.5	3.0	6.3	7.3	5.0		
Variigated Fairy-wren	10	2.8	0.5	2.8	0.5	1.5	0.3		
Red-backed Fairy-wren	24	5.0	7.8	4.8	5.8	6.0	5.8		
Spotted Pardalote	18	0.3	2	2.3	1.3	1.3	2.3		
<b>Striated Pardalote</b>	24	7.8	5.5	6.3	7.8	8.3	14.0		*
White-browed Scrubwren	22	1.5	4.3	2.0	2.5	1.8	2.3		
Large-billed Scrubwren	11	1.5	0	1.0	0.3	1.0	0.8		
<b>Weebill</b>	6	0	0	0	0.3	1.3	1.5	**	**
<b>Brown Gerygone</b>	17	0.3	1.0	1.3	0.3	2.3	2.8	**	**
<b>White-throated Gerygone</b>	19	1.0	1.5	0.3	1.3	3.3	1.3	*	
Brown Thornbill	22	5.5	3.8	3.8	3.5	2.5	2.8		
Buff-rumped Thornbill	4	0	2.0	0.8	0.3	0	0		
Yellow-rumped Thornbill	21	1.8	4.0	3.8	5.3	4.3	3.0		
Yellow Thornbill	3	0	0	0.5	0	0.3	0		
Striated Thornbill	5	1.0	0	0	0	0	2.0		
Striped Honeyeater	23	2.0	2.5	5.0	3.0	5.0	4.5		
<b>Noisy Friarbird</b>	23	14.3	11.8	15.0	15.5	4.8	4.5	*	*
Little Friarbird	21	6.5	12.5	4.0	3.8	4.5	2.0		
<b>Blue-faced Honeyeater</b>	21	1.3	2.0	2.0	1.8	4.0	9.3	**	***
Bell Miner	1	0	0	0	0.3	0	0		
Noisy Miner	24	25.3	33.3	15.5	14.0	13.0	20.8		
Lewin's Honeyeater	24	2.0	4.8	4.8	4.0	5.8	4.5		
Yellow-faced Honeyeater	20	4.5	1.8	1.0	2.5	3.5	2.0		
White-throated Honeyeater	17	5.5	0.5	1.0	2.3	1.3	4.0		
White-naped Honeyeater	6	1.5	1.0	0.3	0	0	1.8		

Species	NC (/24) <sup>a</sup>	Mean number counted per Year						Significance	
		1981 1984	1985 1988	1989 1992	1993 1996	1997 2000	2001 2004	K-W <sup>b</sup>	S <sup>c</sup>
<b>Brown Honeyeater</b>	23	2.3	4.3	7.3	2.8	5.3	8.0		*
Eastern Spinebill	5	0	0.3	0	0.8	0.3	0.3		
Scarlet Honeyeater	23	2.8	6.3	3.8	6.3	5.5	2.3		
Jacky Winter	2	0.5	0	0	0	0	0		
Eastern Yellow Robin	23	2.0	4.3	4.5	3.0	4.5	4.3		
<b>Grey-crowned Babbler</b>	23	2.0	9.0	3.8	6.5	9.0	7.0		**
Eastern Whipbird	22	1.5	3.5	4.0	2.0	3.3	2.8		
Spotted Quail-thrush	1	0.75	0	0	0	0	0		
Varied Sittella	4	1.3	0	0.3	0.3	0	0		
Crested Shrike-tit	5	0	0	0.3	0.8	0	1.0		
<b>Golden Whistler</b>	21	0.5	1.5	2.0	3.0	1.8	2.5		*
Rufous Whistler	19	2.5	1.5	0.8	2.8	3.0	3.8		
Little Shrike-thrush	2	0	0	0	0	0.3	0.3		
<b>Grey Shrike-thrush</b>	21	1.0	1.5	2.8	2.8	2.8	2.8		*
Black-faced Monarch	7	0.3	0	0.5	0.5	0.8	0.3		
Spectacled Monarch	2	0	0	0	0.3	0.3	0		
White-eared Monarch	1	0	0	0	0.3	0	0		
Leadend Flycatcher	20	1.5	0.8	1.5	1.8	2.3	1.5		
Satin Flycatcher	2	0.3	0	0	0	0	0.3		
Restless Flycatcher	10	1.0	0.3	1.0	0.3	0.5	0.3		
Magpie-lark	24	27.5	36.0	35.5	24.3	43.8	48.0		
Rufous Fantail	23	1.8	4.0	3.0	2.3	2.3	3.0		
Grey Fantail	24	3.0	2.3	4.3	2.3	4.0	3.0		
<b>Willie Wagtail</b>	24	7.3	9.3	10.3	14.8	10.8	14.3		*
<b>Spangled Drongo</b>	18	0.3	1.5	1.8	2.8	1.8	2.5		*
Black-faced Cuckoo-shrike	24	21.5	14.8	15.8	11.3	13.8	17.8		

Species	NC (/24) <sup>a</sup>	Mean number counted per Year						Significance	
		1981 - 1984	1985 - 1988	1989 - 1992	1993 - 1996	1997 - 2000	2001 - 2004	K-W <sup>b</sup>	S <sup>c</sup>
White-bellied Cuckoo-shrike	3	0	0	0	0.5	0.5	0.3		
Cicadabird	2	0	0	0	0	0.5	0.3		
<b>Ground Cuckoo-shrike</b>	8	2.3	4.0	0	0	1.8	0.8	*	
White-winged Triller	7	1.0	0.8	0.3	2.3	0.1	1.0		
Varied Triller	2	0	0	0	0	0.5	0.3		
Olive-backed Oriole	22	2.5	2.8	2.3	2.3	2.5	2.8		
<b>Figbird</b>	24	10.8	12.0	14.3	25.5	23.0	28.5	*	**
White-breasted Woodswallow	7	1.3	0.3	0.3	0	1.0	0		
Masked Woodswallow	1	0	0	0	0.3	0	0		
White-browed Woodswallow	1	0	0	0	1.0	0	0		
<b>Dusky Woodswallow</b>	2	25.5	0	0	0	0	0		*
Grey Butcherbird	23	4.0	4.5	5.8	3.0	3.3	6.8		
<b>Pied Butcherbird</b>	24	21.0	14.8	11.0	8.3	6.5	7.5	**	***
<b>Australian Magpie</b>	24	20.5	39.8	32.0	24.3	46.0	61.0	*	**
Pied Currawong	23	6.8	7.5	3.5	2.0	6.5	4.3		
Paradise Riflebird	1	0	0	0	0.3	0	0		
<b>Torresian Crow</b>	24	52.0	43.5	37.0	27.8	62.3	55.8	*	
White-winged Chough	1	0	0	0	0	1.5	0		
Satin Bowerbird	4	0	0	0.8	0.3	0.3	0		
Singing Bushlark	13	1.3	2.8	1.0	1.3	0.3	0.8		
Richard's Pipit	22	9.0	5.3	2.8	4.3	5.5	2.5		
<b>House Sparrow</b>	24	13.5	22.0	15.0	34.0	5.5	6.3	*	*
Zebra Finch	16	29.5	9.3	4.8	25.5	12.3	0.3		
Double-banded Finch	20	2.3	5.3	2.0	13.8	12.5	2.3		
Plum-headed Finch	4	0	0	12.5	2.0	0.5	0.5		

Species	NC (/24) <sup>a</sup>	Mean number counted per Year						Significance	
		1981 - 1984	1985 - 1988	1989 - 1992	1993 - 1996	1997 - 2000	2001 - 2004	K-W <sup>b</sup>	S <sup>c</sup>
Red-browed Finch	15	1.8	5.3	6.8	6.3	3.8	0.3		
Nutmeg Mannikin	1	1.3	0	0	0	0	0		
Chestnut-breasted Mannikin	15	62.5	23.5	12.3	8.5	2.0	1.0		
<b>Mistletoebird</b>	16	0.8	1.0	0	1.0	2.8	2.8	***	**
White-backed Swallow	4	0.8	1.5	0	0	0	0.5		
Welcome Swallow	24	15.3	31.3	26.3	9.0	13.8	10.0		
Tree Martin	7	0.5	3.0	8.0	0	0.3	5.0		
<b>Fairy Martin</b>	24	60.5	64.5	42.5	51.0	31.0	19.5	*	***
<b>Clamorous Reed-Warbler</b>	22	8.3	10.5	2.3	1.5	1.5	2.5	**	***
<b>Tawny Grassbird</b>	13	1.8	0.5	0	0.3	1.0	2.8	**	*
Rufous Songlark	2	0.5	0	0.3	0	0	0		
Brown Songlark	11	1.0	0.75	0.75	0.75	1.5	0		
Golden-headed Cisticola	23	6.8	13.5	8.8	5.3	7.3	3.5		
Silvereye	20	3.5	4.3	3.5	1.8	5.8	3.0		
Russet-tailed Thrush	3	0.3	0.3	0.5	0	0	0		
<b>Common Myna</b>	24	6.8	19.3	24.8	36.5	37.5	29.3	*	**
<b>Common Starling</b>	24	104.3	81.3	36.5	30.5	32.5	23.3	***	***

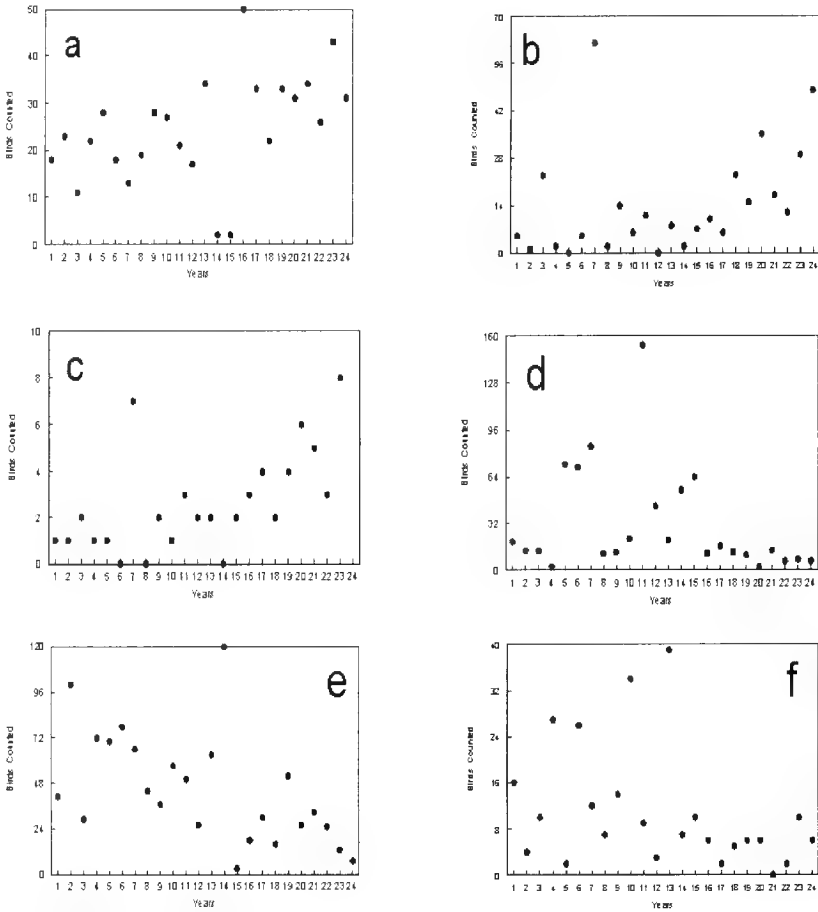
<sup>a</sup> NC (/24) = number of counts the species was recorded on, out of 24 counts.

<sup>b</sup> K-W = statistical testing of differences between: 1981/88, 1989/96; and 1997/2004 using Krusal-Wallis one-way analysis of variance.

<sup>c</sup> S = statistical testing of correlation between number of birds counted and year (1981-2004) using Spearman Rank Correlation.

\* = P < 0.05; \*\* P < 0.01, \*\*\* = P < 0.001.

Species in bold showed significant changes in abundance.



**Fig. 2.** Some significant changes in the numbers of birds counted from 1981 to 2004.

**Increased:** a. Crested Pigeon; b. Rainbow Lorikeet; c. Blue-faced Honeyeater.  
**Decreased:** d. Cockatiel; e. Fairy Martin; f. Noisy Friarbird.

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## DISCUSSION

The aim of this study was to undertake a long term survey to detect changes in the avifauna of the Brisbane Valley and to monitor some of the effects of increasing settlement. The surveys were conducted in a limited range of habitats and recorded a total of 217 bird species, less than half that recorded by Roberts (1979) for the whole of south-east Queensland which contains many diverse habitats including coastal and marine systems.

This roadside survey and the garden bird survey (conducted mainly in Greater Brisbane) (Woodall 2002) used very different methods to monitor changes in bird abundance. Nevertheless both surveys showed that similar changes are occurring in the abundance of some species, particularly those species that utilise suburban gardens. Some of this concurrence may be due to the steady increases in settlement, and in the area of suburban habitat available in the Brisbane Valley.

Some abundant species in Table 1 (Common Starling, Torresian Crow, Fairy Martin, Australian Magpie, Masked Lapwing, Magpie-lark, Galah, Cockatiel, and Common Myna) were most recorded in open pasture, reflecting both the prevalence of this habitat along much of the survey route and the ease of counting these species at some distance from a road. The increased settlement of Esk Shire during this survey period has replaced more areas of open grasslands with houses and their associated gardens have clearly benefited some species of birds.

Many species that showed significant increases in numbers during the survey (Table 1) also increased the in suburban gardens of south-east Queensland (Woodall 2002). These species included Spotted Turtle-dove, Crested Pigeon (Fig. 2a), Rainbow Lorikeet (Fig. 2b), Australian King-Parrot, Blue-faced Honeyeater (Fig. 2c), Figbird, Australian Magpie, Torresian Crow and Common Myna. They are adaptable larger species able to take advantage of suburban gardens. The new gardens may have also favoured Grey-crowned Babbler, Brown Honeyeater, Willie Wagtail and Spangled Drongo which all showed significant increases in this survey but not in the garden bird survey.

The counts were conducted in October and thus exclude winter migrants. Despite this the results are comparable with those of Leach & Hines (1987) who conducted year round surveys in the Marburg District adjacent to the Brisbane Valley. They surveyed a route south of the Warrego Highway that slightly overlaps our survey route at Minden (and for c. 4 km N). They recorded 207 terrestrial and aquatic species (179 of which were also recorded during the Brisbane Valley surveys in October) during 153 year round surveys.

The introduced Common Myna became well established in the Brisbane Valley during the survey (Table 1). Leach and Hines (1987) tracked the movement of this invasive

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species from the west to the east of the Marburg area between 1977 and 1982. During the Brisbane garden bird survey Common Myna increased significantly from 1979/80 to 1999/2000 (Woodall 2002).

The increase in the Grey-crowned Babbler (Table 1) may be due to the increased planting of vegetation around houses and is a contrast to the decline of the species elsewhere in Australia (Garnett & Crowley 2000). Flocks of Long-billed and Little Corelias (Table 1) were recorded in the Brisbane Valley from 1998 and 2000, respectively. Neither were recorded by Roberts (1979) or Leach and Hines (1987) but were recorded from Brisbane suburbs and the Gold Coast from the mid-1980's (Palliser 1985, Niland 1986).

The increase in numbers of the Striated Pardalote may be an artefact due to the movement of Stop 4 (to count a farm dam) further up a hill and nearer to a roadside bank where many pairs nested. Increases in other woodland/forest birds, such as Emerald Dove, White-throated Tree-creeper, Weebill, Golden Whistler, Grey Shrike-thrush, Brown Gerygone and Mistletoebird have no obvious explanation. Although not statistically significant, Wedge-tailed Eagles have shown a trend of increasing mean numbers over the survey period. This species may have benefited from an increase in road kills caused by greater vehicular traffic on roads.

Decreases in House Sparrow and Common Starling correspond with similar declines in suburban gardens elsewhere in south-east Queensland (Woodall 2002). Reduction in House Sparrow numbers is a world-wide phenomenon which probably has many causes including competition from other species and reduction in their nest sites while the Common Starling may be facing competition from the increasing numbers of Common Mynas.

The Cockatiel decline is dramatic from 1989-1996 to 1997-2004 (Fig. 2d, Table 1). Large flocks were regularly seen in the earlier surveys when it was one of the most abundant species. The reasons for this are not clear but may be associated with changes in land management. There was been a similar steep decline in the Chestnut-breasted Mannikin numbers between 1981 and 2004 but the change was not statistically significant.

Aerial feeders like the Rainbow Bee-eater and Fairy Martin (Fig. 2e) have both shown significant declines and the Welcome Swallow has also shown a similar trend (Table 1). Low rainfall in recent years may have reduced overall productivity, resulting in a decline of insect numbers. Increased grazing pressure on emergent vegetation and other areas of tall grass around some farm dams may have caused local habitat loss and the decline in the numbers of Clamorous Reed-warbler. The Golden-headed Cisticola showed a similar trend but it was not statistically significant. In contrast, the Tawny Grassbird has shown a significant increase in numbers, possibly because it can better utilise rank vegetation away from water.

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The significant declines in mean numbers of the Pied Butcherbird, Noisy Friarbird (Fig. 21) (and the similar trend shown by the Little Friarbird) are not readily explained in terms of local habitat changes alone and they were relatively stable in the garden bird survey (Woodall 2002).

The Nankeen Kestrel showed a significant decline from 1981-1988 to 1989-1996 but then a significant increase in 1997-2004. The Ground Cuckoo-shrike and White-throated Grcygone also declined in this middle period of the survey but then, so did some species that showed increases in numbers during the survey, overall (Crested Pigeon (Fig. 2a) Blue-faced Honeyeater (Fig. 2c), Australian Magpie, Torresian Crow). It is likely that the extremely dry years of 1991, 1993-2005 contributed to these temporary declines.

Several possible irruptions were noted. Painted Button Quail was recorded twice, in 1990 (3 birds) and in 1992 (18 birds) when they were very common on the tracks of Deongwar State Forest. Marchant & Higgins (1997) reported that numbers of this species vary between years, and that seasonal dispersal or cyclic fluctuations may be the cause. Dusky Woodswallow was also recorded twice in 1981 (2 birds) and in 1982 (100 birds).

Leach (1996) recorded a highly significant increase in records of the Crested Pigeon at Marburg between 1981 and 1993 corresponding to a similar significant increase in this survey. Leach (1996) also recorded a highly significant decrease in the number of records for the Willie Wagtail which contrasts with the increase in numbers that we recorded. Both species may be taking advantage of the greater number of residential gardens.

Two species, the Banded Lapwing and the Ground Cuckoo-shrike are considered characteristic of this area. Both are found in short open grassland and both are relatively uncommon, being recorded on less than half of the surveys.

There is ongoing and widespread loss of natural habitats in south-east Queensland due to the high rates of human settlement and the expectation of declines in many species of birds, particularly the smaller forest dwelling species (Catterall & Kingston 1993). In this study more species increased in numbers than declined over the study period. This is probably due to a combination of local changes such as the "re-vegetation" of many areas along the roads surveyed with the development of suburban gardens in areas that had previously been cleared for grazing and wider influences. Seventeen of the 24 species increased in abundance according to this survey (Spotted Turtle-Dove, Long-billed Corella, Rainbow Lorikeet, Australian King-Parrot, Striated Pardalote, Weebill, Brown Honeyeater, Golden Whistler, Grey Shrike-thrust, Willie Wagtail, Spangled Drongo, Fighird, Torresian Crow, Mistletobird), also increased in abundance throughout their Australian ranges over the same period (Barrett et al. 2003, Table 7 & 10).

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### Appendix 1. Description of route for Brisbane Valley Survey

The survey starts at the small dam north of Minden Primary School just after dawn and moves north-east to Atkinson's Dam, stopping to view three farm dams from the road and Lyons Bridge. We stop at the picnic area of Atkinson's Dam for breakfast and survey the lower part of the lake from the picnic area, followed by a drive to the north-west to observe its upper reaches. We then proceed to Seven Mile Lagoon and then drive through Coominya and onto the Brisbane Valley Highway to Esk. We stop at Esk to survey the environmental park on Redbank Creek and then move west to Deongwar State Forest where, after lunch, we walk down a gravel road in sclerophyll closed forest for about 2 km.

We then return to Esk on the same road stopping at the second Redbank Creek crossing. From Esk we retrace our path south on the Brisbane Valley Highway stopping to view a large inlet of Wivenhoe Dam. After crossing the dam wall we turn north for a short stop at the Splityard Creek Dam. We then move north into Kipper Creek Road and walk the final 2 kms, usually ending at dusk. All birds seen or heard are counted at each stop and on the roads between stops. Care is taken to avoid double counting any birds, especially those seen in flight and when the route doubles-back on a previously covered stretch of road. The total length of the route is 176 km.

Stop	Location	Cumulative Distance (km)	GPS Location
1	Minden Dam & Primary School	0	27° 33.105'S 152° 32.556'E
	<b>Travel NE on Lowood-Minden Road.</b>		
2	Farm dam	4.7	27° 30.819'S 152° 33.184'E
	<b>Travel NE on Lowood-Minden Road.</b>		
3	Farm Dam	7.3	27° 29.452'S 152° 32.937'E
	<b>Travel NE on Forest Hill-Fernvale Road.</b>		
4	Cutting above Farm Dam	12.3	27° 28.405'S 152° 32.103'E
	<b>Travel NE on Mt Tarampa Road.</b>		
5	Lyons Bridge on LockyerCreek	13.1	27° 28.252'S 152° 31.802'E
	<b>Travel NW on Forest Hill-Fernvale/Mt Tarampa/ Coominya Connection/ Atkinson's Dam Roads.</b>		
6	Atkinson's Dam	25.1	27° 25.309'S 152° 27.033'E
	<b>Travel W on Atkinson's Dam Road.</b>		

Stop	Location	Cumulative Distance (km)	GPS Location
7	Atkinson's Dam NW end	27.8	27° 24.837'S 152° 25.692'E
	<b>Return on Atkinson's Dam Road, the SW on Boyces Watson's/Banool /Haslingden/ Jimba Roads.</b>		
8	Seven-mile Lagoon	40.2	27° 27.241'S 152° 25.243'E
	<b>Return to Watson's/ Coominya Connection Road, then N through Coominya and NW on Brisbane Valley Highway to Esk, Esk-Hampton Road.</b>		
9	Esk, Redbank Creek Crossing #1, walk in environmental park	81.8	27° 14.700'S 152° 25.181'E
	<b>Travel W on Esk-Hampton Road.</b>		
10	Deongwar SF	102.8	27° 18.925'S 152° 15.349'E
	<b>Walk to small creek and return.</b>		27° 18.572'S 152° 14.837'E
	<b>Return E on Esk-Hampton Road.</b>		
11	Redbank Creek crossing #2	121.0	27° 15.233'S 152° 23.869'E
	<b>Return to Esk then SE on Brisbane Valley Highway.</b>		
12	Wivenhoe inlet, Five-mile Creek	137.5	27° 18.183'S 152° 30.363'E
	<b>Travel SE on Brisbane Valley Highway and Wivenhoe-Somerset Road.</b>		
13	Splityard Creek	166.6	27° 22.310'S 152° 38.151'E
	<b>Travel NE on Kipper Creek Road.</b>		
14	Kipper Creek	176.6	27° 20.259'S 152° 39.614'E
	<b>Walk to cattle grid and return.</b>		27° 20.435'S 152° 39.868'E

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## BREEDING BY EGRETS IN THE BROAD SOUND AREA, CENTRAL QUEENSLAND

ROGER JAENSCH, ROBERT BLACK, LORELLE CAMPBELL  
AND WAYNE HOUSTON

Egret breeding colonies are rare and important biological assets that are inherently vulnerable to disturbance or loss. Many breeding colonies appear to be components of networks of sites. Some sites are used only intermittently. A comprehensive knowledge of the locations and characteristics of all colonies and networks is vital for managing and conserving egrets. For Australian egrets, knowledge of these networks is incomplete and many breeding colonies, especially in remote inland and tropical coastal regions, are poorly known.

Whilst surveying waterbirds on the central Queensland coast we observed regular movement of hundreds of egrets between the Torilla Plain and the adjacent Broad Sound. These observations covered two short periods from 30 March to 1 April in 2004 and from 20-21 February in 2005. Numerous flocks of five to 50 egrets flew to and from the southern part of the Plain following the same narrow corridor over the edge of the Plain leading in a south-westerly direction towards the Sound. These flights occurred daily and were most frequent in the first half of the morning.

A twenty-minute count at mid-morning on 31 March 2004 from a point near the seaward edge of Torilla Plain yielded 740 egrets, 212 flying seaward and 528 returning. This traffic included four species of egrets in the following proportions: Intermediate Egret *Ardea intermedia* (65%), Great Egret *A. alba* (15%), Cattle Egret *A. ibis* (10%) and Little Egret *Egretta garzetta* (10%). Opportunistic observations at other times indicated a higher proportion of Cattle Egrets.

By climbing trees on low hills beside the mangroves we saw that on reaching the coast the birds were turning NW and heading across Broad Sound. We knew from satellite images taken in 1997 that in this direction there were two elongated mangrove blocks (or 'islands') separated by narrow channels from each other and from the mangroves fringing Torilla Plain. The more distant outer island lay approximately one kilometre offshore.

We watched the egrets at midday on 1 April 2004 from a small dry-land gap in the mangroves several kilometres to the N, from a direction roughly perpendicular to their flight path. They were alighting in, and departing from, mangroves at the southern end of the outer island (22° 29.4' S, 149° 58.4' E). We concluded that a mixed species colony of egrets was breeding on the outer, un-named, mangrove island.

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Combining the earlier tally of 740 flying egrets with a count of 800 seen feeding on several parts of the Plain and an estimate of how many egrets might be attending nests (probably a smaller number than for birds flying or feeding), we deduced that 1000 to 2000 pairs of egrets may have been breeding in March-April 2004. This was based on our experiences at other egret breeding colonies and recognising that undercounting usually occurs.

In both years of observations, conditions for feeding by egrets on the Torilla Plain appeared to be good because many wetlands were inundated and vigorous growth of wetland plants had occurred, despite below-average rainfall. Feeding habitats included freshwater marshes dominated by short grasses, sedges and aquatic forbs; fresh and brackish open ponds and channels; damp and dry grasslands; and, especially for Little Egrets, shallowly inundated saline flats.

In the dry winter period egrets are far fewer on the Torilla Plain than during the wet summer and most egrets clearly spend the winter elsewhere. An Intermediate Egret with a faded blue wing tag seen on Torilla Plain on 1 April 2004 was tagged during 1993-4, or later, at the Macquarie Marshes in central New South Wales (M. Maddock pers. corn.). Movements of this species from the Macquarie Marshes to other locations along the eastern seaboard of the continent are also known (McKilligan 2005, M. Maddock pers. corn.).

Barnard (1913) reported hundreds of egrets, probably of three species, apparently nesting on 12 March on a mangrove island separated from Torilla Plain by a channel. The precise location of that colony was not described but the sense conveyed was of a site close to shore, unlike the outer island site used in 2004. The inner island of the island pair observed in 2004 is a recent feature, hence it is unlikely to have provided the location for the earlier colony. Aerial photographs dated 1956 and topographic maps that were based on aerial photography from the 1970s show only the outer island.

There are few records of egret breeding colonies on the central Queensland coast (Blakers *et al.* 1984, Barrett *et al.* 2003). Small known colonies are clustered along the lower Fitzroy River floodplain and estuary (e.g. Murray Lagoon and Botanic Gardens, Rockhampton, spring-summer 2003-4 and 2004-5) (J. McCabe pers. corn.; Houston & McCabe 1996; Longmarc 1978) and near Gladstone (P. O'Neill pers. corn.). Given the considerable extent of egret feeding habitat and mangrove forest on the long Queensland coast, it is likely that additional colonies exist.



Comprehensive documentation of this egret colony in Broad Sound may require aerial survey by helicopter to determine its precise location and size. Ground inspection may be hazardous because saltwater crocodiles are known to occur in the Sound and access by boat may be difficult due to large tidal range, strong tidal currents and shallow sediments.

The un-named island site of the present Broad Sound egret colony is within the Great Barrier Reef Marine Park and a declared Fish Habitat Area. The principal egret feeding areas on the Torilla Plain are in private freehold tenure and the landholders endeavour to manage their cattle grazing enterprises to ensure that environmental values are sustained.

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## BOOK REVIEW

HERONS, EGRETS AND BITTERNS — THEIR BIOLOGY AND CONSERVATION IN AUSTRALIA, BY NEIL McKILLIGAN, UNIVERSITY OF SOUTHERN QUEENSLAND. PUBLISHED IN MARCH 2005 BY CSIRO PUBLISHING, COLLINGWOOD, AUSTRALIA, 2005. WWW.PUBLISH.CSIRO.AU.

144 PAGES, 240 X 170 MM PAPERBACK - ISBN: 0643091335 - AU 534.95.

Many bird artists only work on herons, egrets or bitterns. Perhaps, as author Neil McKilligan says in his Introduction, this is because they are "elegant and eye-catching". From that aesthetic observation, the author then goes on to nine chapters dealing with taxonomic relationships, biology, distribution, movements, longevity, feeding and food, breeding, populations, conservation and the value of herons economically and aesthetically. Further chapters deal with each of the species known in Australia and the occasional visitors. Finally, there is an index and a very wide list of references essential for those studying egrets.

In the preface, the author defines his use of the general term heron, to cover herons, egrets and bitterns, and this generality will be followed in this review. Ancient families are discussed and it seems the oldest known Ardea is a fossil 7 million years old. World classification is given by a table of the Ciconiiformes and its relevance to Australia. In Chapter 1 the habitat of herons is correctly defined as high in biodiversity and in structural diversity. The author then places various species into their feeding niches. Herons, although often appearing in mixed groups, nevertheless adopt habitat partitions and sound descriptions are given of these and the species appropriate to them. There is a very readable discussion of the distinction of heron flight with reference to their wing measurements.

Modified neck vertebrae and tendons gives herons their neck articulation thus providing them with one of their major physical characteristics and that rapier like thrust towards prey. It is in this section that one is thankful for the general language of this wonderful book. While scientific terms are used throughout, there are immediate vernacular descriptions of what is meant. This makes the book of value to both professional and amateur ornithologist alike. Throughout, there are many notable considerations given of heron biology, *for example*, the explanation of what they can see with the eye placement they have.

Hérons are discussed as bio-indicators in considering the complexity of wetlands. Their predation at aquaculture establishments and the huge variation in their success here is shown. There are nine important heron areas in Australia and the birds' use of these is defined. The difference between breeding and non-breeding areas is shown. A further biological split between "day herons" and "night herons" is used to better understand the use of food resources. Throughout this book there are tables to clearly

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show differences in courtship, diets, foraging behaviour, foraging water depth, etc. The chapter on population numbers and conservation is both lucid and interesting. It often deals with the problems of various regional wildlife management so pinpointing actions that are or need to be taken.

There are 20 excellent colour photographs of each Australian species and very well done vignettes to make this book appealing. There are 24 illustrations throughout, good maps, and explanatory monochrome photographs. After the very detailed general section on herons, there is a section detailing each Australian species. A similar section then follows this on occasional visitors.

This book is a wonderful way to learn about this widespread group of birds. It should appeal to students, amateur and professional ornithologists working on the management or the biology of members of the group. It is a superb and easy read for anyone wanting to better understand the biology of herons.

*IAN VENABLES, 7 Aberfoyle Street, KENMORE Q 4069*

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## BOOK REVIEW

BIRDS OF THE DARLING DOWNS : A LAND MANAGER'S GUIDE  
BY GREG FORD AND NICCI THOMPSON. PUBLISHED IN 2005.

AVAILABLE FROM THE LANDCARE DISCOVERY CENTRE, PO BOX 6243,  
TOOWOOMBA. PHONE: 07 4637 6201. COST: \$20.00 (PLUS \$5.00 POSTAGE)

This well-illustrated book sets out to provide an easy-to-use guide to the most common birds on the Darling Downs, to explain how birds might serve as indicators of landscape health and give advice on how to manage a property to benefit its community of birds. It devotes about half of its pages to the 96 more common birds, each with a photograph and a brief description of its appearance, behaviour and habitat. Very sensibly it gives the bird its local name(s) as well as the official common name.

The birds are grouped according to the habitat they typically occupy: grassy woodlands, softwood scrubs etc. As many species are to be found in a wider range of habitats than the groupings of the 96 suggest this arrangement could confuse the beginning bird watcher. This of course was a weakness in Caley's classic book 'What bird is that?' but it works better here with the smaller number of species. For completeness the book also gives a checklist of the 200 or so species found in this region, with an indication of their habitat (s).

The book goes on to describe in more detail the habitats of a number of 'indicator' species. For a species recovery programme we obviously need a thorough understanding of that species' habitat requirements and 'What can I do to help' strategies are given here for each indicator species. I confess I am uncertain about the value of the indicator species concept. For example, a species diversity index, with the yardstick being the pristine (or closest to it) habitat, might be a more operationally useful measure of habitat quality as a management guide.

I feel the essence of this book is embodied in its section entitled 'Habitat Management' where six fundamental principles are presented. Also a new abbreviation for me: K.I.M.M. -- Keep it Messy, Mate (with the mention here of both K.I.S.S. and K.I.M.M. this starts to sound like a certain TV comedy series!). But seriously, K.I.M.M. means keep dead trees, ground litter, rocks etc to give structural diversity to the landscape and that is a very important message.

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Obviously this book is not intended as a 'stand-alone' guide to bird identification. Fewer than half the region's birds are illustrated and of course photographs have their limitations in showing identifying features. Some good field guides are listed under 'Further Reading'. What makes this book special is its local focus, the clear connections it makes between the presence of particular bird species on a property and the availability of particular sets of resources and its guidance to property managers who wish to preserve or re-establish these resources in order to have the birds there.

***NEIL McKILLIGAN, 1 Box Street, TOOWOOMBA Q 4350***

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## INSTRUCTIONS TO AUTHORS

*The Sunbird* is published periodically by Birds Queensland (Queensland Ornithological Society Inc) to further the knowledge of birds in Queensland and adjacent northern regions of Australia.

Papers are invited from non-members as well as members on all aspects of ornithology, e.g. life history, taxonomy, distribution, behaviour and ecology. Papers may take the form of major articles on specific birds, birds in specific areas or habitats, or short notes on either birds themselves or the literature on birds, such as reviews of books or comments on published articles.

Submission of a paper implies that the results reported have not been published and are not being considered for publication elsewhere. The editor reserves the right to submit records of rare birds to the Records Appraisal Committee as part of the refereeing process.

Manuscripts can be supplied on floppy disk, by e-mail, or in typed form on paper. When typed, the manuscript should be double-spaced and sent in duplicate. Papers longer than four typed A4 pages should have a summary. If needed, help may be given to authors to find relevant literature. Common names, scientific names and order of names should follow Christidis, L. & Boles, W.E. 1994. *The taxonomy and species of birds of Australia and its territories*. RAOU Monograph 2. Intending authors should consult recent issues of *The Sunbird* to see acceptable forms of contributions. An appropriate referee prior to acceptance assesses each submission.

References should be listed in alphabetical order at the end of papers in the following styles; titles of journals will be abbreviated as in the *World List of Scientific Periodicals*.

FLEAY, D.H. 1973 Nesting habits of the brush turkey. *Emu* 36: 153-163.

FRITH, H.J. (Ed.) 1976. Malice fowl. In *Complete Book of Australian Birds*, pp. 136-137. Sydney: Reader's Digest.

SERVENTY, D., SERVENTY, V.N., & WARHAM, J. 1971. *The Handbook of Australian Sea-birds*. Sydney: Reed

Tables and Figures should be numbered with Arabic numerals. Drawings and diagrams should be in electronic form, preferably as an .eps, or .jpg file. [f authors cannot arrange suitable drawings, the editor may assist in their preparation. Authors may submit photographs (preferably black and white) with their manuscripts. Reprints may be obtained at cost price by special request.

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