CORELLA

Journal of the Australian Bird Study Association

VOLUME 21 MARCH, 1997 NUMBER 1

Corella, 1997, 21(1): 1–16

HISTORICAL AND SEASONAL CHANGES IN THE COMMUNITY OF FOREST BIRDS AT LONGNECK LAGOON NATURE RESERVE, SCHEYVILLE, NEW SOUTH WALES

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Received: 12 October, 1995

Observations dating back to 1937, banding data accumulated from 1965 to 1994 and census data collected from 1992 to 1995 have been used to show the changes in a community of forest birds at Longneck Lagoon Nature Reserve on an historical and seasonal level. Many resident species have disappeared from the site. These include Diamond Firetail, Zebra Finch, Hooded Robin, Red-capped Robin, Scarlet Robin, Flame Robin and Black-eared Cuckoo. Other species have declined markedly (Speckled Warbler, Weebill, Brown Treecreeper, Black-chinned Honeyeater, Jacky Winter and Fuscous Honeyeater) while some species have increased in numbers (Brown Thornbill, Superb Fairy-wren and Red-browed Finch). New additions to the community include Spotted Turtle-Dove, Red-whiskered Bulbul, Common Blackbird, Common Myna, Common Starling and House Sparrow, but these have not as yet made an observable impact on the proportions of native species within the community. Seasonal fluctuations in the community are quite marked with up to 34 non-resident species visiting the site with the Rose Robin being the only exclusively winter visitor. The only recorded movement greater than 2 km from the site, was that of a Sacred Kingfisher that travelled to central eastern Queensland. Interaction between the Brown and White-throated Treecreepers as well as the three species of finch (Red-browed Finch, Diamond Firetail and Double-barred Finch) is examined in light of their proportional representation of the resident community. Natural and human induced changes at the site and their effects on the decline and demise of species are also examined.

INTRODUCTION

In February 1992 a three year study to examine the avian distribution in a forested area at Longneck Lagoon Nature Reserve, Scheyville, New South Wales, was initiated by the authors and is presently being prepared for publication.

This site's avian fauna, which incorporated a mix of coastal and western species, was rarely encountered on the Cumberland Plain in recent times and so became a well-known haunt for countless birdwatchers and other ornithologists. The avian species that made this site of special interest were Hooded Robin, Diamond Firetail, Red-capped Robin, Black-eared Cuckoo, Weebill, Speckled Warbler, Brown Treecreeper, Black-chinned Honeyeater, and Buff-rumped and Yellow-rumped Thornbills coupled with rare sightings of Turquoise Parrots and Regent Honeyeaters.

Very little data on this now unique Cumberland Plain assemblage have been documented with

published studies being limited to foraging segregation of Australian warblers (Recher 1989), the selection of tree species by Acanthizidae (Recher and Majer 1994), soft part colours in Fuscous Honeyeaters (Lane 1974), characteristics for separating brown birds of the species Superb Fairy-wren and Variegated Fairy-wren (Hardy 1983), lists of species present (Douglas and Wilson 1985, Kinhill 1990) and comments on occurrences and conservation (Antcliff 1989a, 1989b, 1991; Roberts 1993 and Keast 1995).

On examining the banding records which date back to 1965, coupled with the authors' own observations, it became apparent that several species of birds had disappeared, the number of individuals of several other species had decreased while others had increased and a few new species had become established at this site. The Reserve also hosts a great variety of both winter and summer visitors. The aim of this paper is to document these historical and seasonal changes. Comparisons are made between the data for Longneck Lagoon Nature Reserve and other study sites in New South Wales and Australian Capital Territory.

STUDY SITE

The site (33°36'S, 150°54'E, 10 m to 40 m a.s.l.) is a remnant area of Grey Box-Ironbark Woodland (Benson 1992; Cohn and Hastings 1994) situated 7 km ENE of Windsor on the north-western edge of the Cumberland Plain (Fig. 1). This woodland community is found on soils derived from underlying Wianamatta Shale and was once extensive around the peripheries of the Cumberland Plain. Clearing for urbanization and agriculture has reduced its occurrence to a few isolated remnants (Benson 1992). The study site forms part of the 'largest, best preserved, most viable stand now remaining' (Douglas and Wilson 1985). The major tree species are *Eucalyptus moluccana* (Grey Box) and *E. crebra* (Narrow-leaved Ironbark) with smaller numbers of *E. tereticornis* (Forest Red Gum) and *E. eugenioides* (Thin-leaved Stringybark) being present. The understorey is dominated by *Bursaria spinosa* (Blackthorn) with several species of *Acacia* scattered throughout the site. Grassy areas covered approximately half the total area when surveyed in 1984 (Recher 1989) but since that time Blackthorn growth within that part of the Reserve

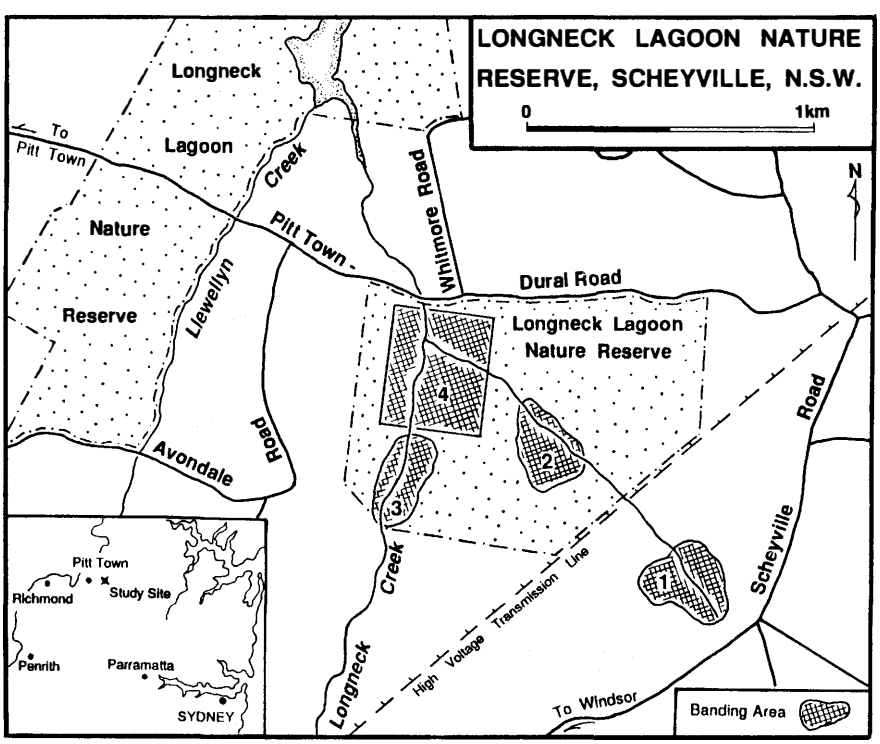


Figure 1. *Map showing location of Longneck Lagoon Nature Reserve and banding sites within the Reserve.*

encompassing the banding areas has increased and has reduced the extent of the grassed areas (H. Recher, pers. comm.). Over the last few years some thinning of the Blackthorn thickets has occurred in banding Area 4 (Fig. 1). Whether this is due to the recent drought conditions or a response to the filling out of the tree canopy could not be determined. Most of the forested area is relatively young (approximately 50 years) and tree species, except for some growing beside Longneck Creek, are of uniform age. The upper reaches of Longneck Creek and its various smaller tributaries flow through the site. These are ephemeral and for most periods of the year are either dry or restricted to a series of deep pools. The largest and deepest of these pools has not been known to dry out completely and thus provides a vital water source for birds during dry periods.

METHODS

Observational data

Requests were made to known visitors to the site for access to any sighting records they held. Members of the Cumberland Bird Observers and the New South Wales Field Ornithologists Clubs were also approached to ascertain if they held any records of their visits and sightings (see acknowledgments for a list of all respondents). Records of the late Keith Hindwood (held by E. Hoskin) and Arnold McGill (deposited at the Australian Museum) were also searched for appropriate sightings. Added to these field observations were data compiled from banding records dating back to 1965 and the authors' own observations from 1992 to 1994. The above sources were able to provide 9 303 individual sightings dating back to 1937.

Census data

During the three year period March 1992 to February 1995 three small areas within Area 4, each one and a half hectares, were censused. The procedure followed that described by Loyn (1986) where the number of birds of each species was recorded in each census area during a 20 minute period, generally between 0930 h and 1100 h, once every month. Census surveys were carried out on the same day as banding.

Banding data

Banding at this site commenced in 1965 and has continued to date. Visits were irregular and varied from 18 visits during 1976 to zero during 1966, 1967 and 1985. Different parts of the woodland were utilized over the years (Areas 1, 2 and 3 in Fig. 1) with Area 4 being used exclusively from 1992 to 1994. Area 1 is outside the current Reserve boundary but still lies within the Grey Box-Ironbark Woodland. Prior to 1992, no details were kept on the number of nets set during each visit and for how long they were erected. A thorough analysis of the fluctuations of the different species comprising this diverse fauna based on comparable capture rates was thus not possible. Analysis was limited to the comparison of the percentage of each resident species for each year banding was carried out. This percentage was calculated by totalling the number of individuals of a resident species trapped in a particular year and dividing it by the total number of individuals of all resident species trapped in that year and then converting the fraction into a percentage. From 1992 to 1994, 20 nets, totalling 280 m, were erected each banding trip at set net sites in different habitats within Area 4. Banding was carried out one day every month.

Verification of sighting data

Some sightings submitted to the authors have not been accepted as they either fell outside the expected range (Blakers *et al.* 1985) or habitat for that species. We therefore believe that they were either misidentifications or aviary escapees. They have been listed below in case verification comes at a later date: Bar-shouldered Dove *Geopelia humeralis* (1992), Varied Lorikeet *Psitteuteles versicolor* (1992), Forest Kingfisher *Todiramphus macleayii* (1962, 1969 and 1978), Torresian Crow *Corvus orru* (1990 and 1993), Brown Cuckoo-Dove *Macropygia amboinensis* (1984) and Skylark *Alauda arvensis* (1968).

RESULTS

Movements

Eleven short-range movements into Longneck Lagoon Nature Reserve from a now abandoned banding site at Cattai, 2 km north-east, have been recorded. A Grey Shrike-thrush banded at Cattai on 25 November, 1967 was retrapped in the Reserve on 9 February, 1975 (Anon. 1975), as was a Fuscous Honeyeater banded on 28 December, 1960 (Anon. 1975a). Unpublished data from the Cattai site revealed movements of a further six Fuscous Honeyeaters, two Grey Shrike-thrushes and one White-naped Honeyeater to the Reserve between 1968 and 1977. There was only one record of a bird making the reverse journey — an Eastern Yellow Robin banded at the Reserve on 14 October, 1973 was retrapped at Cattai on 27 December, 1973 (Anon, 1974). A Red-browed Finch banded on 22 June, 1974 was recovered dead on 12 September, 1974 at Maraylya, 1.6 km north of the Reserve.

The only substantial recorded movement away from the Reserve was that of a Sacred Kingfisher banded on 5 December, 1981 and subsequently "found dead half-way between Ayr and Home Hill, Queensland on 17 October, 1985 a distance of 1 588 km NNW" (Anon. 1986).

Seasonal Changes

The list of seasonal visitors that frequent this site numbers 34 different species (Table 1) and arrival and departure times for several species were established (Fig. 2). This is an accumulation

TABLE 1

Yearly sightings of birds that are 'seasonal visitors' at Longneck Lagoon Nature Reserve from 1937 to 1994. B = species known to breed in the reserve. D = species recorded at Doonside (Keast 1995).

SPECIES			37	38	39	40	47	49	50	53	54	57	59	62	66	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
Oriental Cuckoo *Cuculus saturatus*																						•																						
Pallid Cuckoo *C. pallidus*	D	B	•														•		•	•	•	•	•	•	•	•	•	•		•		•	•	•		•	•		•	•	•	•	•
Brush Cuckoo *Cacomantis variolosus*		B																•	•		•	•	•	•	•								•						•	•	•	
Fan-tailed Cuckoo *C. flabelliformis*	D	B																•	•	•	•	•	•	•	•	•	•	•				•		•	•		•	•	•	•	•	•	•
Black-eared Cuckoo *Chrysococcyx osculans*	D	B														•			•										•														
Horsfield's Bronze-Cuckoo *C. basalis*	D	B	•														•	•	•	•	•	•	•	•	•	•	•														•	•	•	•
Shining Bronze-Cuckoo *C. lucidus*	D	B	•			•												•	•	•		•	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	•	•	•
Common Koel *Eudynamys scolopacea*														•															•												•	•	
Channel-billed Cuckoo *Scythrops novaehollandiae*																																									•		
White-throated Needletail *Hirundapus caudacutus*																						•		•	•	•	•	•													•	•	
Sacred Kingfisher *Todiramphus sanctus*	D	B	•							•								•	•	•	•	•	•	•	•	•	•					•					•	•	•	•	•	•	•
Rainbow Bee-eater *Merops ornatus*		B						•	•	•		•								•			•	•	•	•			•			•	•								•	•	•
Dollarbird *Eurystomus orientalis*		B	•													•		•		•	•	•		•	•		•					•										•	•
White-throated Gerygone *Gerygone olivacea*	D	B	•						•				•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•
Yellow-faced Honeyeater *Lichenostomus chrysops*		B														•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
White-naped Honeyeater *Melithreptes lunatus*	D	B																•	•		•	•	•		•			•	•	•	•									•		•	•
Scarlet Honeyeater *Myzomela sanguinolenta*		B							•							•						•			•															•	•		
Scarlet Robin *Petroica multicolor*																					•	•							•															
Flame Robin *P. phoenicea*										•				•						•	•	•			•			•															
Rose Robin *P. rosea*						•								•			•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•
Rufous Whistler *Pachycephala rufiventris*	D	B													•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Black-faced Monarch *Monarcha melanopsis*															•																										•	•	•
Leaden Flycatcher *Myiagra rubecula*	D	B									•									•			•	•	•	•				•	•										•	•	•
Satin Flycatcher *M. cyanoleuca*																						•	•									•									•			
Restless Flycatcher *M. inquieta*	D	B	•	•	•	•								•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•		•		•	•	•
Rufous Fantail *Rhipidura rufifrons*	D																•	•	•	•	•	•	•		•	•						•								•	•	•	•
Cicadabird *Coracina tenuirostris*	D	B													•	•	•	•	•	•	•			•									•								•	•		
White-winged Triller *Lalage sueurii*	D	B	•	•			•	•				•	•			•	•	•	•	•	•	•		•	•	•	•	•		•	•		•	•			•	•		•			
Olive-backed Oriole *Oriolus sagittatus*	D	B																•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•
Dusky Woodswallow *Artamus cyanopterus*	D	B	•	•				•						•	•		•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•		•		•	•	•	•	•	•
Tree Martin *Hirundo nigricans*																				•	•	•	•	•	•	•																	
Fairy Martin *H. ariel*		B															•	•	•	•	•	•			•	•						•					•		•	•	•	•	•
Rufous Songlark *Cincloramphus mathewsi*		B	•	•													•		•			•			•		•										•						
Silvereye *Zosterops lateralis*	D	B																•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

of many years' records and records the first and last sightings in each year.

The only recorded specific winter visitor was the Rose Robin. All other seasonal visitors frequented the site over spring, summer and autumn.

Insufficient data were obtained to determine the 'period of stay' of the following species: White-throated Needletail, Oriental Cuckoo, Black-eared Cuckoo, Common Koel, Channel-billed Cuckoo, Scarlet and Flame Robins, Satin Flycatcher and Tree Martin.

An analysis of the data showed arrival and departure times fluctuated considerably for the following species: Horsfield's Bronze Cuckoo, Shining/Golden Bronze Cuckoo, Fairy Martin, Rufous Songlark, Dusky Woodswallow and Restless Flycatcher. No clearly defined departure or arrival times could be delineated.

Blakers *et al.* (1985) suggested that the Restless Flycatcher and Fan-tailed Cuckoo may be migratory in some areas. These two species were sighted in all months with no influx to or departure from the Reserve detected but these sightings do not take into account individuals that may have been replaced by other birds 'in transit'. Further censusing and banding is required to establish their status as a resident species.

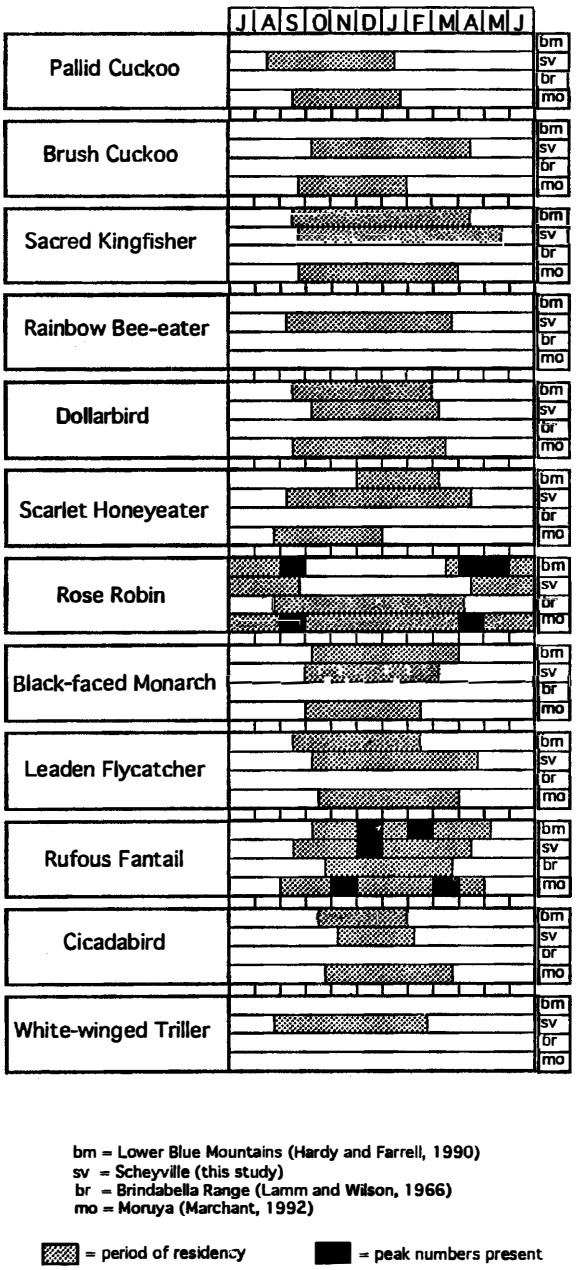


Figure 2. *Comparison of periods of residency (July to June) for some migrant species found at Moruya, Blue Gum Swamp Creek (lower Blue Mountains), Brindabella Range and Scheyville.*

Some species were also sighted throughout the year, but showed substantial increases during certain months. The data on these were obtained from March 1992 to February 1995, when more systematic censusing and banding permitted precise comparisons. Rufous Whistler numbers increased from September to a maximum in November and then declined to April (Fig. 3A). Silvereye numbers were not as well defined with peaks in April, May, August and November (Fig. 3B). The build up to a maximum in April is shown by both census and banding data, while the maxima in August and November are only evident in banding data. Yellow-faced Honeyeater numbers (Fig. 3C) show a similar pattern with corresponding maxima in April, August and November with the rise to a peak in April being more clearly defined. An increase in the number of White-naped Honeyeaters counted during April (Fig. 3D) coincided with that of Silvereyes and Yellow-faced Honeyeaters, but capture data show only a small presence in May. Both data series show an increased presence in August and September. White-throated Gerygones first appeared in numbers during October with maximum counts obtained in November and December and then a reduction from January to April (Fig. 3E). Males arrive 7–10 days prior to females (H. Recher, pers. obs.). Olive-backed Oriole counts in census data (Fig. 3F) commenced in September, but then showed a rather dramatic increase during November. This increase is mirrored by the number captured. Active oriole nests were observed at the site and the percentage of juveniles trapped in comparison to the total number of orioles trapped during November and December (when the young fledged) was 33. A published movement from the foothills of the Blue Mountains, west of the Reserve, to near Lismore, New South Wales (Anon. 1967) indicates that this species can travel considerable distances from the western Sydney region.

Historical changes

During the period defined by our data the year by year presence or absence of each species has been established (Tables 1, 2 and 3). Many species have disappeared from this site while others have established residency.

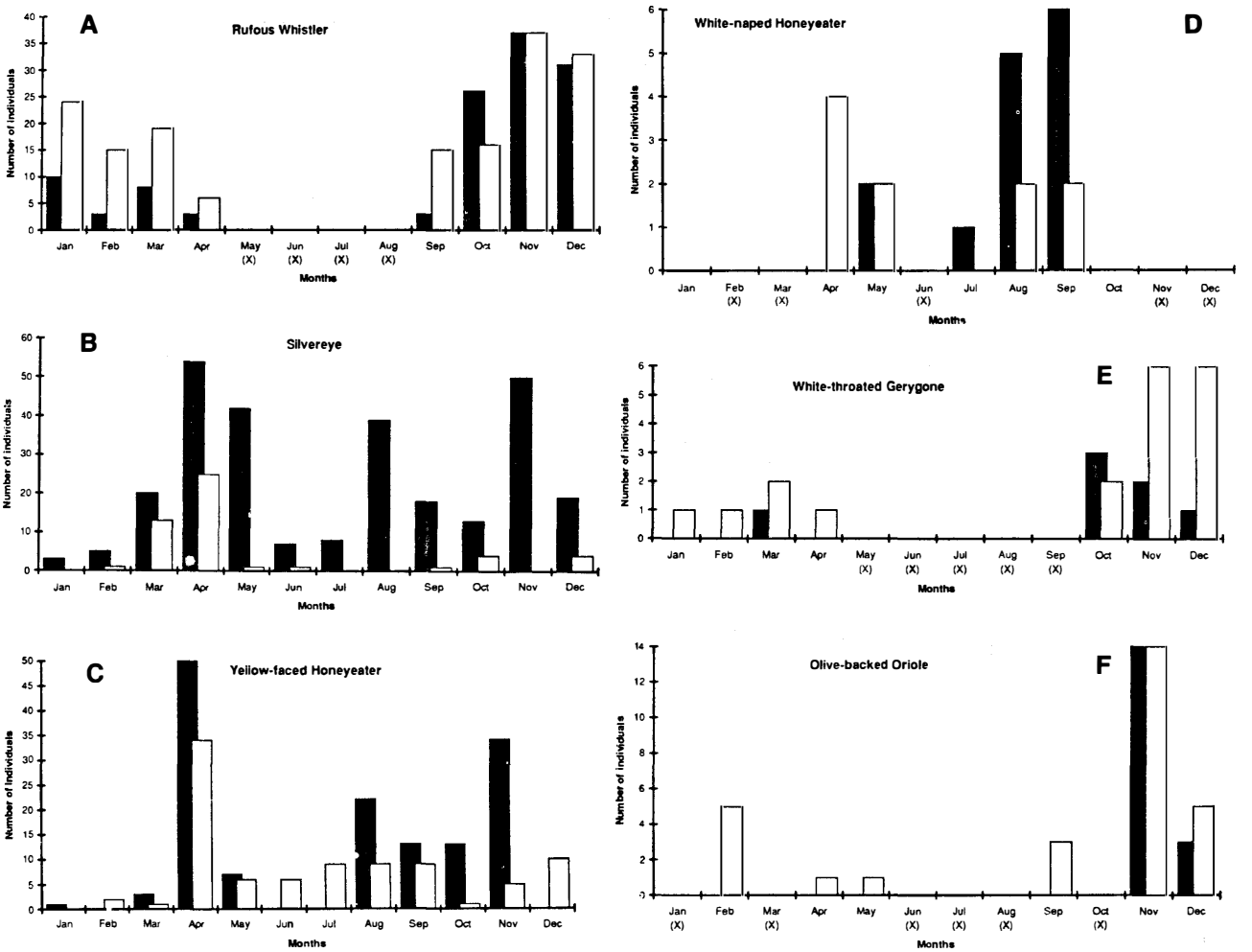


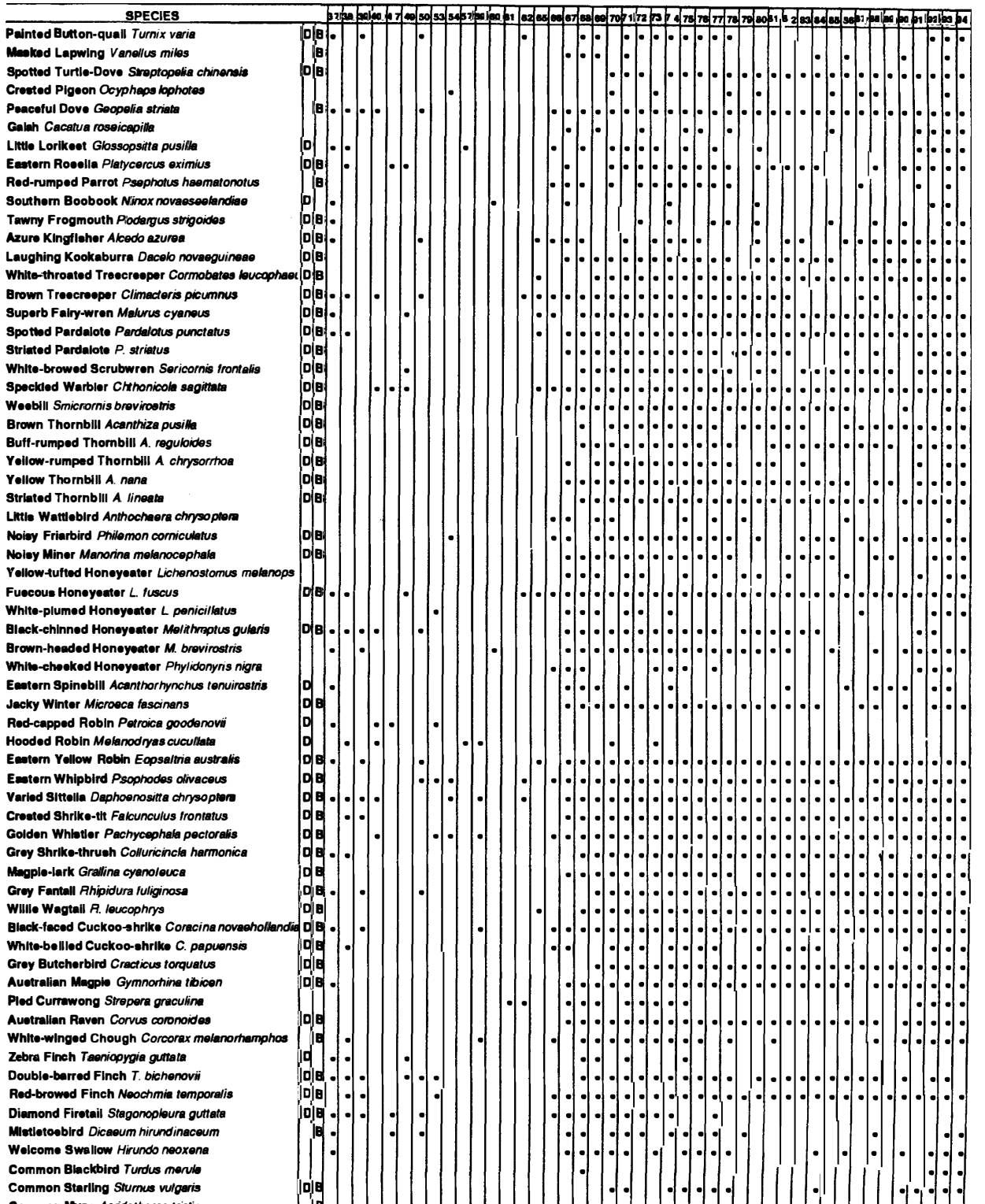
Figure 3A–F: A. *Rufous Whistler,* B. *Silvereye,* C. *Yellow-faced Honeyeater,* D. *White-naped Honeyeater,* E. *White-throated Gerygone,* F. *Olive-backed Oriole. Total number of birds banded (■) and total number counted (□) for the three census areas. Censusing and banding were carried out monthly from March 1992 to February 1994.* X = *species not banded or counted but observed at the site.*

DISAPPEARANCES

Unfortunately many of the species that disappeared were the species that made this site unique on the Cumberland Plain (Tables 1 and 2). Red-capped Robins have not been sighted since 1953 but sightings have been recorded in the Castlereagh State Forest (15 km to the south-west) as recently as 1994 (J. Dark, pers. comm.). Scarlet and Flame Robins have not been sighted since 1980 and 1978 respectively, although these birds have been reported elsewhere in the district after these dates (R. Jacobs, pers. comm.). Of special note is the disappearance of the Hooded Robin with the last sighting during 1973. Of the four species of finch, two — the Diamond Firetail and Zebra Finch — have not been seen since 1977 and 1975 respectively. Sightings of Zebra Finches continue to be reported from the Hawkesbury/Penrith district, but it seems that the Diamond Firetail is locally extinct. Black-eared Cuckoos have not been recorded at the site since 1987. There was a 10 year break between 1969–79 when this species was not recorded at the site so it may hopefully return in the future.

TABLE 2

Yearly sightings of birds deemed to be residents (past and present) at Longneck Lagoon Nature Reserve from 1937 to 1994. B = species known to breed in the reserve. D = species recorded at Doonside (Keast 1995).



ADDITIONS

Additions to the resident community have included: Spotted Turtle-Dove (from 1970); Red-whiskered Bulbul (first sighted 1969–71 but then not sighted until 1990 onwards); Common Blackbird (first sighted in 1968 and then not sighted until 1992, but is now regularly seen and trapped); Common Myna and Common Starling (first observed in 1970 and then constantly sighted since 1988 and 1990 respectively); and House Sparrow (first sighted in 1970 and then sighted spasmodically until 1990 but has not been recorded at the site since then).

RARE SIGHTINGS

Rare sightings (Table 3) at this site have included: Bush Stone-curlew, Long-billed and Little Corellas, Turquoise and Swift Parrots, White-throated Nightjar, White-backed Swallow, Bassian Thrush, Brown Gerygone, Little Grassbird, Variegated Fairy-wren, Masked Woodswallow, New Holland Honeyeater, Regent Honeyeater and Richard's Pipit. The arid form of the Black-faced Cuckoo-shrike (Slater *et al.* 1986) was caught in November 1994.

COMMUNITY ANALYSIS

Comparative abundance of resident species is presented in Table 4. Some species show fluctuations in percentages over time, but have maintained a viable population (e.g. Golden Whistlers and Yellow Robins). Others show rather erratic fluctuations and periods of zero capture (e.g. Peaceful Dove, Azure Kingfisher, Willie Wagtail, Grey Fantail and White-browed Scrubwren).

Species that have increased their proportional representation of the resident community of forest birds are the Brown Thornbill and Superb

TABLE 3

Sightings of rare visitors to Longneck Lagoon Nature Reserve from 1937 to 1994. B = species known to breed in the reserve. D = species recorded at Doonside (Keast 1995).

SPECIES			37	57	58	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	88	90	91	92	93	94
Bush Stone-curlew *Burhinus grallarius*	D														•																
Common Bronzewing *Phaps chalcoptera*						•																		•						•	•
Yellow-tailed Black-Cockatoo *Calyptorhynchus funereus*							•								•			•	•									•	•		
Long-billed Corella *Cacatua tenuirostris*																														•	•	
Little Corella *C. sanguinea*							•																							•	•	
Sulphur-crested Cockatoo *C. galerita*		B												•	•		•								•					•	•	
Musk Lorikeet *Glossopsitta concinna*								•	•																						•	
Swift Parrot *Lathamus discolor*													•										•									
Turquoise Parrot *Neophema pulchella*			•				•	•		•	•					•	•					•										
White-throated Nightjar *Eurostopodus mystacalis*				•																												
Australian Owlet-nightjar *Aegotheles cristatus*		B																					•								•	•
Variegated Fairy-wren *Malurus lamberti*																						•									•	
Brown Gerygone *Gerygone mouki*																	•									•						
Red Wattlebird *Anthochaera carunculata*									•			•		•																•	•	
Regent Honeyeater *Xanthomyza phrygia*	D	B			•	•				•			•										•									
Bell Miner *Manorina melanophrys*									•																							
Lewin's Honeyeater *Meliphaga lewinii*								•	•		•	•									•							•				
White-eared Honeyeater *Lichenostomus leucotis*																			•	•		•				•						•
New Holland Honeyeater *Phylidonyris novaehollandiae*																																•
Masked Woodswallow *Artamus personatus*	D	B																														•
White-browed Woodswallow *A. superciliosus*	D	B	•	•			•				•	•	•		•					•		•										•
Richard's Pipit *Anthus novaeseelandiae*		B																				•										
House Sparrow *Passer domesticus*										•	•													•			•	•				
White-backed Swallow *Cheramoeca leucosternus*																							•									
Red-whiskered Bulbul *Pycnonotus jocosus*									•	•	•																•		•	•	•	•
Little Grassbird *Megalurus gramineus*				•						•																		•				
Bassian Thrush *Zoothera lunulata*																																•

TABLE 4

List of all resident species trapped and banded at Longneck Lagoon Nature Reserve showing their comparative abundance from 1965 to 1994 (excluding 1966, 1967 and 1985). Percentage of captured resident community = total number of individuals of species trapped divided by total number of trapped individuals comprising the resident community for each year, multiplied by 100.

SPECIES	65	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	86	87	88	89	90	91	92	93	94
Pacific Black Duck *Anas superciliosa*																											0.2
Little Pied Cormorant *Phalacrocorax melanoleucos*																											0.2
White-faced Heron *Egretta novaehollandiae*							0.3															0.5					
Black Bittern *Ixobrychus flavicollis*																									0.1	0.1	
Painted Button-quail *Turnix varia*			1.5				0.9																			0.1	
Spotted Turtle-Dove *Streptopelia chinensis*																			2.8							0.1	
Peaceful Dove *Geopelia striata*					0.8	0.5	1.8	0.9					0.5	1.4	2.5	0.9		2.8					3		0.1	0.4	0.4
Eastern Rosella *Platycercus eximius*								3.5																0.6	0.3	0.1	
Australian Owlet-nightjar *Aegotheles cristatus*																	0.9									0.1	
Azure Kingfisher *Alcedo azurea*	4.2						0.9		0.4							1.8						4.4	3		1.4	2.1	2
Laughing Kookaburra *Dacelo novaeguineae*		1.3					0.3	0.9	0.4	1.8					0.5	1.8					1.6	0.5		1.7		0.3	0.4
White-throated Treecreeper *Cormobates leucophaeus*											2.3		3.8		2	1.8			2.6	2.7	1.6	1.5	3	1.7	2.3	3.2	1.8
Brown Treecreeper *Climacteris picumnus*	8.3			20.6	0.8	0.5	0.6		0.8			5.7	0.5	0.8	1.5	1.8								0.6	0.1		
Superb Fairy-wren *Malurus cyaneus*	8.3	1.3	1.5	4.2	2.3	3.3	4.5	6.2	8.3	6.3	14	10	27	9.7	15	9.1	9.3	25.6	6.3	10	20	10	25	6.4	16	19	16.4
Variegated Fairy-wren *M. lamberti*																0.9											
Spotted Pardalote *Pardalotus punctatus*	17	6.9	2.9		2.3	2.7			1.7		1.5			2.2	2	3.6	13			5.5				12.6	1.7		4.6
Striated Pardalote *P. striatus*		3.8	24.1						0.4					0.6	0.5									8.7			1.4
White-browed Scrubwren *Sericornis frontalis*					2.3	0.5	2.1	3.5	1.2	7.8	0.8	1.4		1.9	2.5		0.9	2.6	2.8	3.6	2.3	5.9		0.6	1.4	1.2	4.8
Speckled Warbler *Chthonicola sagittata*	8.3	6.3	6.6	4.2	15.5	8.2	11	16	10	7.8	8.3	11	11	4.4	9.1	2.7	6.5	5.1	5.6	2.7	3.9	9.3		1.7	2.6	1.6	1.8
Weebill *Smicromis brevirostris*		2.5	6.6	4.2		1.1			0.4			2.9	0.5	0.8			2.6		2.8								
Brown Gerygone *Gerygone mouki*																			19.4								
Brown Thornbill *Acanthiza pusilla*						0.5	1.2							0.3		0.9	3.7		2.8	0.9	3.1	0.5		0.6	0.1	0.6	2
Buff-rumped Thornbill *A. reguloides*					2.3	2.7	2.4		3.7	1.6	0.8	1.4			1	0.9	2.8		2.8			0.5		0.6	0.3	1.5	1.3
Yellow-rumped Thornbill *A. chrysorrhoa*			1.5							1.6																	
Yellow Thornbill *A. nana*					1.6	1.1	0.3	6.2	1.2		4.5		1.1	0.6	1	2.7	2.8	7.7	8.3		0.6	1.5		0.6	3.8	1.9	3.8
Striated Thornbill *A. lineata*		1.3	2.9		9.3	8.8	1.2	3.5	1.7	4.7	2.3	10	1.8	3.9	1	0.9	16.7		16.7	5.5	3.9		3	4.1	1.4	0.3	3.6
Little Wattlebird *Anthochaera chrysoptera*																										0.1	
Noisy Friarbird *Philemon corniculatus*																								0.6			
Noisy Miner *Manorina melanocephala*						1.8										0.9					3.9						
Lewin's Honeyeater *Meliphaga lewinii*					0.8																						
Yellow-tufted Honeyeater *Lichenostomus melanops*					1.6				0.4															0.6		0.1	
Fuscous Honeyeater *L. fuscus*	36	47	17.5	25	36.4	32	16	12	52	10.9	15	20	19	52.5	29	37	1.9			44	12	12	5	36.6	7.8	5.6	6.4
White-plumed Honeyeater *L. penicillatus*					0.8																						
Black-chinned Honeyeater *Melithreptus gularis*			1.5		1.6	1.6			0.4					1.1	0.5	1.8								0.6			
White-cheeked Honeyeater *Phylidonyris nigra*																									1	1.9	
Jacky Winter *Microeca fascinans*		2.5	3.6		1.6	1.1	0.6	1.8	0.8				0.5	0.3	0.5											0.1	
Hooded Robin *Melanodryas cucullata*							0.6																				
Eastern Yellow Robin *Eopsaltria australis*	8.3	10	2.9	16.7	10.9	14	14	13	5	10.9	12	11	17	8.1	8.6	9.1	8.3	2.6	19.4	10	16	20	40	11	12	10	7.5
Eastern Whipbird *Psophodes olivaceus*			0.7				1.5	2.7		1.6	0.8		1.6		2.5	1.8					2.3	1.5			0.6	0.5	0.5
Varied Sittella *Daphoenositta chrysoptera*													1.1													0.1	
Crested Shrike-tit *Falcunculus frontatus*			1.5	4.2		0.5	1.8	2.7	1.7	3.1		2.9	2.2	1.1	1					0.9	0.8			1.2	1	1	1.3
Golden Whistler *Pachycephala pectoralis*			1.5		1.6	3.3	7.5	4.4	0.6	4.7	2.3	13	3.3	3.1	1.5	3.6	20.4	20.5	5.6	2.7	3.9	3.4		0.6	7.4	3.4	9.8
Grey Shrike-thrush *Colluricincla harmonica*			0.7			0.5	0.9	4.4	1.2	1.8			1.1	1.4	0.5	0.9				1.8	2.3	1.5		2.3	1.4	0.4	0.4
Magpie-lark *Grallina cyanoleuca*							0.6	0.9	0.8						0.5	0.9											0.4
Grey Fantail *Rhipidura fuliginosa*			1.5		0.8	1.6	1.5	1.8	0.8	1.6	0.8		1.6	0.6	0.5		2.6			1.8	3.1		3	0.6	2	1.6	2.5
Willie Wagtail *R. leucophrys*	4.2	6.3		6.3	1.6	2.2	0.3		0.8	1.6	3	1.4	1.1	1.7	1.5	0.9						1.5	8	1.2	0.6	0.1	1.1
Black-faced Cuckoo-shrike *Coracina novaehollandiae*							0.3		1.2			2.9													0.4		0.2
White-bellied Cuckoo-shrike *C. papuensis*																											0.2
Grey Butcherbird *Cracticus torquatus*						1.6	0.9	1.6			0.8		1.1			0.9		2.6		0.9	0.8	0.5			0.6	0.3	
Australian Magpie *Gymnorhina tibicen*					0.8		0.3	0.9			0.8		0.5										3				0.2
White-winged Chough *Corcorax melanorhamphos*						0.5																					
Double-barred Finch *Taeniopygia bichenovii*		2.5	7.3	12.5	2.3	2.2	5.1	4.4	2.1	6.3	4.5			0.8	1.5		0.9								0.6	0.3	
Red-browed Finch *Neochmia temporalis*	4.2	1.3	5.8		1.6	6	22	8.8	1.2	26.6	25	5.7	4.4	2.8	13	12	6.5	30.8		7.3	17	25	8	4.1	33	41	24.6
Diamond Firetail *Stagonopleura guttata*		5.1	6			0.5																					
Mistletoebird *Dicaeum hirundinaceum*																										0.1	0.4
Red-whiskered Bulbul *Pycnonotus jocosus*																										0.1	
Bassian Thrush *Zoothera lunulata*																											0.2
Common Blackbird *Turdus merula*																									0.1	0.3	0.2
Common Myna *Acridotheres tristis*																						0.5					
VISITS	1	9	11	3	14	14	16	9	18	7	7	4	9	15	11	6	5	4	3	3	6	12	3	4	12	12	12

Fairy-wren. Brown Thornbills, although seen in most years from 1968 onwards, were not trapped until the period 1972–73 and then, after a break of six years, from 1980 to 1994 (with none trapped in 1981, 1984 and 1990). Even though percentage increase is small the regularity in trapping from 1982 onwards indicates that this species has become more common. Superb Fairy-wrens are one of two species of fairy-wrens at the site. The Variegated Fairy-wren is present in low numbers and has been recorded only twice — 1982 and 1993. From 1965 to 1976 the percentage of Superb Fairy-wrens in the community remained below 10 per cent, but showed a gradual increase from 1971 to 1975. Figures from 1977 to 1994 show a great deal of fluctuation between 10 to 25 per cent. Apart from 1991, percentage figures from 1977 onwards are all greater than the maximum from 1965 to 1976. This clearly shows an increase in this species at the site.

Those species that have shown a marked percentage decline are the Speckled Warbler, Fuscous Honeyeater, Jacky Winter and Weebill (Table 4). The Speckled Warbler, whose percentage of the resident community reached 16 in 1974 has progressively declined to only two per cent. Fuscous Honeyeaters, although showing great fluctuations from over 50 per cent to zero, have gradually declined in numbers and have recorded less than 10 per cent during the period 1992–1994. Jacky Winters, which were never a common species, show diminishing percentages before 1981, when they ceased to be trapped except for one isolated capture in 1993. Weebills formed a small component of the avian community at the commencement of banding (1968–70), recording a high of 6.6 per cent. This gradually declined over subsequent years with percentages only reaching half that of the peak in 1969. From 1987 no Weebills have been trapped although several have been sighted at irregular times within banding Area 4. Weebills are still abundant in other sections of the Reserve adjacent to Llewellyn Creek (D. McKay, pers. comm.).

Buff-rumped Thornbills' percentage has been regularly low, ranging from 0 to 3.7 with the higher levels recorded pre-1987. This may indicate a historical decline but the differences are too small to be conclusive. Yellow-rumped Thornbills have only been trapped in 1969 and 1976 (Table 4) but their presence has been recorded regularly (Table 2) from the late 60's to early 80's. From our data there was a break between 1984 and 1990 when none were observed, but H. Recher (pers. comm.) has recorded this species regularly during this interval. Sightings were regularly made during our three year study (1992–94).

Comparisons within various groups show some interesting interactions (Fig. 4). Two species of treecreeper, Brown and White-throated, inhabit the site. From 1965 to 1976 the more common species was the Brown Treecreeper (Table 4). No White-throated Treecreepers were caught, although they were recorded at the site in 1965 and then from 1969 onwards (Table 2). During the period 1977 to 1984 relative prominence of the two species tended to seesaw, but from 1986 White-throated Treecreepers were more frequently encountered. Census data shows average sightings of White-throated Treecreepers to be 1.5, 1.8 and 1.7 birds per visit for 1992, 1993 and 1994 respectively, while only one Brown Treecreeper was trapped in June 1992 and another sighted in January 1993.

At the commencement of banding in 1965 three species of finch were trapped (Fig. 5). Diamond Firetails were the most commonly banded species in 1968 and 1969 but numbers dropped drastically and after 1972 none were banded. Since 1977 none have been sighted. Double-barred Finches show a gradual decline from a peak in 1970 to 1984. Even though several individuals were captured in 1992 and 1993, this species is now infrequently seen at the site. In contrast to the above decline and demise, the Red-browed Finch has shown a dramatic rise in numbers and over the last three years has constituted between 25 per cent and 41 per cent of the resident community.

Colemane (in Douglas and Wilson 1985) listed 152 species observed at the site. The data presented is a checklist with no reference to frequency of encounter or dates of sightings and could not be included in Tables 1, 2 and 3 which are time based. Forest birds listed by Colemane that were not recorded by the authors nor any of the other contributors are: Gang-gang Cockatoo *Callocephalon fimbriatum*, Crimson Rosella *Platycerus elegans*, Australian King-Parrot *Alisterus scapularis*, Stubble Quail *Coturnix pectoralis,* Western Gerygone *Gerygone fusca,* Little Friarbird *Philemon citreogularis*, Forked-tailed Swift *Apus*

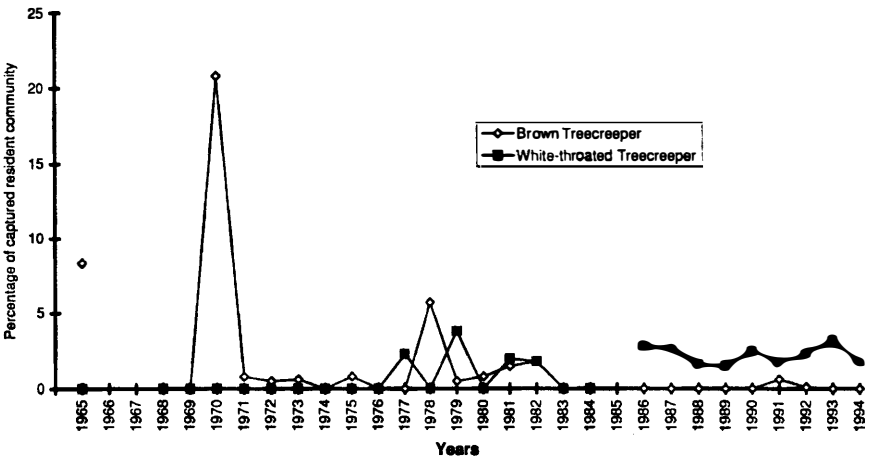


Figure 4. *Comparative abundance of Brown and White-throated Treecreepers at Longneck Lagoon Nature Reserve from 1965 to 1994. Percentage of captured resident community = total number of individuals of species trapped divided by total number of trapped individuals comprising the resident community for each year, multiplied by 100.*

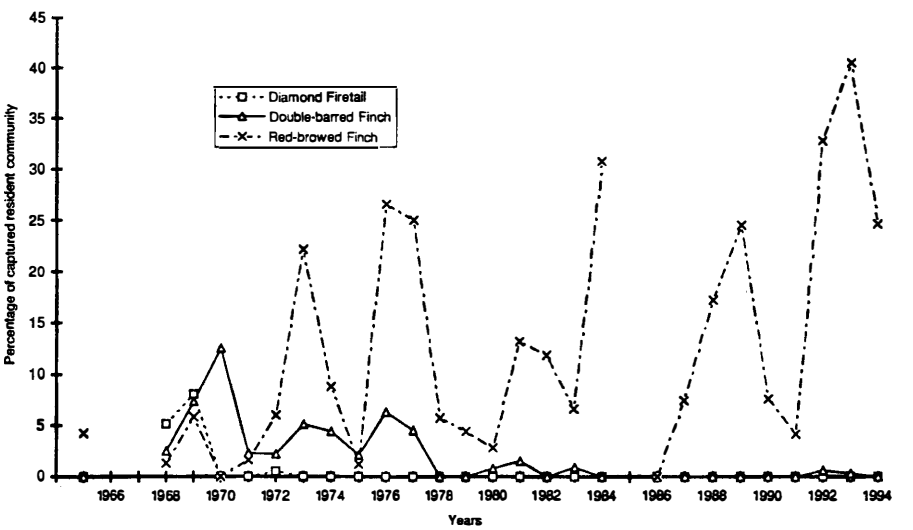


Figure 5. *Comparative abundance of three species of finches (Diamond Firetail, Red-browed Finch and Double-barred Finch) at Longneck Lagoon Nature Reserve from 1965 to 1994. Percentage of captured resident community = total number of individuals of species trapped divided by total number of trapped individuals comprising the resident community for each year, multiplied by 100.*

pacificus, European Goldfinch *Carduelis carduelis*, Plum-headed Finch *Neochmia modesta* (recorded breeding at the site), Spangled Drongo *Dicrurus bracteatus* and Satin Bowerbird *Ptilonorhynchus violaceus*. Colemane also highlighted those species that were known to breed at the site. These data have been added to that obtained by the authors and are presented in Tables 1, 2 and 3.

DISCUSSION

Seasonal changes

Figure 2 demonstrates broad similarities between data on arrival and departure times of migrant species at this site, and at sites in the Brindabella Range, Australian Capital Territory (Lamm and Wilson 1966; Tidemann *et al.* 1988), Moruya, on the south coast of New South Wales (Marchant 1992), and Blue Gum Swamp Creek, lower Blue Mountains (Hardy and Farrell 1990). These sites were chosen for comparison as they were the only published studies within New South Wales and the Australian Capital Territory that documented detailed departure and arrival times of migrant species over a number of years. Most arrival times are comparable, but most summer migrants (excluding Leaden Flycatcher and Pallid Cuckoo) appear to arrive earlier at Moruya than Scheyville.

Departure times show less synchronization with some birds staying at Scheyville much longer than at the other sites (e.g. Sacred Kingfisher). Interestingly, peak numbers of Rufous Fantails visiting Scheyville were in December, in the lower Blue Mountains they were in December and February, while at Moruya they were in November and March. This seems to imply that the influx of these species from the north arrives at Moruya before reaching Scheyville and the lower Blue Mountains and then leaves Scheyville and the lower Blue Mountains before Moruya. This may indicate different migratory routes during spring and autumn, or the 'Moruya' birds may be representatives of a more southerly population than those visiting Scheyville.

Rose Robins are the only exclusive winter visitors to Scheyville. They appear to arrive slightly earlier in the lower Blue Mountains and depart at approximately the same time. Their periods of residency in the Brindabella Ranges (late August to early April) is nearly opposite to that experienced at Scheyville (Fig. 2) and the lower Blue Mountains. At Moruya they are sighted all year round with peak numbers present during April and September. These peaks correspond to those recorded in the lower Blue Mountains.

Rufous Whistlers, although sighted throughout the year, did show an increase in numbers over the October to December period (Fig. 3A). This shows similarity to the lower Blue Mountains where peaks were in October and December.

Silvereye numbers at Moruya peaked in April, May and September while those in the lower Blue Mountains were in May and June. Peak numbers at Scheyville were in April, May, August and November (Fig. 3B). The peaks in the autumn months at all sites reflect the influx of birds from the south (Blakers *et al.* 1985), while those in spring probably represent returning birds.

The major peak in numbers of Yellow-faced Honeyeaters at Scheyville was in April (Fig. 3C). The peak in the lower Blue Mountains was in May. Most Yellow-faced Honeyeaters depart the Brindabella Ranges at the beginning of April so the later peaks at Scheyville and the lower Blue Mountains probably reflect the additional time for birds to migrate north (Hardy and Farrell 1990). The peaks in November at Scheyville and December in the lower Blue Mountains probably represent the passage of birds travelling south.

It was difficult to compare data for White-naped Honeyeaters, as this species is poorly represented in banding records because they spend most of their time at tree-top level and are not commonly mist netted. Capture rates at Scheyville (Fig. 3D) and the lower Blue Mountains were low, but there was a slight increase in August and September, and July respectively.

White-throated Gerygones (Fig. 3E) were recorded in all months of the year at Scheyville, but increased in numbers during October, November and December. Maximum numbers were recorded during October at Moruya. Periods of residency at Moruya and the lower Blue Mountains were clear cut and showed a definite period of absence from May to August.

Marchant (1992) recorded Olive-backed Orioles in all months of the year at Moruya with regular daily sightings from late August to the end of January. At Scheyville sightings also occurred in all months, but there was an increase during November and December (Fig. 3F) which

included an influx of both adult birds and juveniles that were presumed to be the progeny of breeding adults within the Reserve.

Historical changes

The decline in the number of Brown Treecreepers and the subsequent increase in White-throated Treecreepers is dramatic (Fig. 4). Boehm's (1982) study of Brown Treecreepers in South Australia showed that population decline and increase was related to the removal and addition respectively, of fallen timber and offcuts. The woodland at Scheyville contains many young trees that are approximately the same age and this probably reflects a cessation of timber cutting and subsequent regeneration some years back. Only a few older trees remain along Longneck Creek. Timber felled years ago and left to rot has diminished over time and is no longer widespread throughout the Reserve. This fact, coupled with the growth of many new trees, the sparsity of old dead trees and the increased understorey cover, probably was detrimental to the Brown Treecreepers but advantageous to the White-throated Treecreepers.

Hoskin (1991) speculated that the reduction in Diamond Firetail numbers over the Cumberland Plain was due to illegal trapping and habitat loss. The authors have no evidence that illegal trapping occurred in the Reserve. Their demise at this site may simply be due to a reduction in food resources as a consequence of changes in the habitat or competition with the increased numbers of Red-browed Finches. Barker and Vestjens (1984) record that Red-browed Finches feed on a far greater variety of plants than Diamond Firetails, so whatever changes have occurred at Scheyville have favoured Red-browed Finches to the detriment of Diamond Firetails (Fig. 5).

Black-chinned Honeyeaters were never a common species at this site. With only a few sightings since 1984 the prospect for this species' survival in the Reserve is poor.

The specific cause for the decline in Speckled Warbler numbers (Table 4) is not evident but is probably related again to the change in habitat. This species will be the focus for further research in the area. Black-eared Cuckoos have not been sighted since 1987 (Table 1) and are known to parasitize the nests of Speckled Warblers. A fall in the number of Speckled Warblers would then directly affect the numbers of Black-eared Cuckoos frequenting the site and probably accounts for their disappearance.

Weebill percentages have also declined in our sampling areas (Table 4). This species generally forages high in the canopy and tends to feed on the Narrow-leaved Ironbark in preference to the other eucalypts present (Recher 1989). Many small Narrow-leaved Ironbarks (10–20 cm diameter) have been cut down and removed from the Reserve especially in the section encompassing the four banding areas (T. Nixon, pers. comm.). In other sections of the Reserve and particularly along Llewellyn Creek (Fig. 1) where Narrow-leaved Ironbarks are common Weebills are still numerous.

Yellow-rumped and Buff-rumped Thornbills were never a prolific species in this avian community and as such will always remain at risk of local extinction.

The disappearance of the Red-capped and Hooded Robins is difficult to explain. Their diets include a large variety of both insects and arachnids (Barker and Vestjens 1984). As the Reserve hosts many other insectivorous species (e.g. Grey Shrike-thrush, Yellow Robin, Golden Whistler) that have not shown a gradual drop in numbers over time it is difficult to associate their disappearance with a reduction of food resources.

Many of the aforementioned species (i.e. Brown Treecreeper, Diamond Firetail, Speckled Warbler, Red-capped and Hooded Robins and Yellow-rumped Thornbill) forage at ground level and are generally found in areas that are fairly open. Since the 1980s the open grassed areas have been reduced due to the increase in Blackthorn thickets. We suspect that this particular change in vegetative distribution has reduced the environment that was most utilized by the above species of birds and has probably been a key factor in their disappearance or decline (Recher 1991). On the other hand, Brown Thornbills and Superb Fairy-wrens have benefited from the increase in understorey cover and have become more common.

The following introduced birds have been sighted in the study area over a number of years (Tables 2 and 3): Spotted Turtle-Dove, House Sparrow, Red-whiskered Bulbul, Common

Blackbird, Common Starling and Common Myna. Their impact on the native avifauna, on observational evidence, has been minimal. Most have been sighted on the Reserve's periphery and incursions into the woodland have been minor. The Spotted Turtle-Dove, Common Myna and Common Starling have been recorded breeding in the Reserve, but only in small numbers. If these species become more common within the Reserve they will compete for the limited food and nesting resources. Both Common Mynas and Common Starlings nest in tree hollows which are in short supply due to the lack of old, mature trees. Native species, particularly parrots that frequent the Reserve (Tables 2 and 3), would find themselves in direct conflict for these hollows.

Keast (1995) lists the birds observed from 1930 to 1960 in Cumberland Plain Woodland at Doonside approximately 20 km south of Scheyville. He states that this woodland has 'now been destroyed or largely alienated as [a] bird habitat'. He also says that 'a small segment [of similar vegetation] possibly survives near Prospect Reservoir'. This particular woodland has been classified by Benson (1992) as the same Grey Box–Ironbark Woodland that exists at Scheyville. Data presented by Keast in combination with the data presented in this paper give an excellent insight into the avian fauna of western Sydney stretching back more than 60 years.

The avian fauna at Doonside differs considerably in species composition from that at Scheyville. The Scheyville community appears to have been more diverse with 15 species from Scheyville not being recorded at Doonside (Tables 1, 2 and 3) during the period 1930–60. The only species recorded at Doonside and not recorded at Scheyville were the Painted Honeyeater *Grantiella picta* and Southern Whiteface *Aphelocephala leucopsis*. After 1960 an additional 41 species were observed at Scheyville. This figure does not include the eleven species recorded by Colemane (in Douglas and Wilson 1985) that lacked dates of sightings. This increase is probably due to more regular observations from 1965 when banding commenced and not a sudden influx of species into the site.

Keast (1995) designates a number of species as 'visibly rarer than before' and 'effectively eliminated' from Cumberland Plain Woodlands of western Sydney. Listed as 'effectively eliminated' are the Bush Stone-curlew and Regent Honeyeater. These two species were rare visitors to Scheyville, the former only being sighted once in 1975 and the latter on five occasions, the last being in 1983. The Red-capped Robin, Hooded Robin and Black-eared Cuckoo, also listed in this category, have not been sighted since 1953, 1973 and 1987 respectively. We agree with Keast's determination for these five species. Also listed as 'effectively eliminated' are the Black Bittern, Cicadabird and Painted Button-quail. At the Reserve, Black Bitterns have been mist netted on two occasions (1992 and 1993). The study site lacks ideal habitat for bitterns but Longneck Lagoon just downstream is ideal and they probably reside there. Because of their secretive nature they may be in higher numbers than envisaged. The Cicadabird was last sighted in 1992 with quite a few sightings prior to this. Painted Button-quail have been observed regularly from 1992 to 1994 with one being trapped in 1993. We feel that an 'effectively eliminated' designation for these three species at Scheyville would be premature.

Those species listed by Keast (1995) as 'visibly rarer than before' in the Cumberland Plain Woodlands are the Zebra Finch, Diamond Firetail, Brown Treecreeper, Black-chinned Honeyeater, Striated Pardalote, Speckled Warbler, Jacky Winter, Crested Shrike-tit, Restless Flycatcher, White-bellied Cuckoo-shrike, White-winged Triller and Double-barred Finch. As previously discussed, no sightings of Zebra Finches and Diamond Firetails since 1975 and 1977 respectively indicates that these two species have been 'effectively eliminated' from the Reserve. Brown Treecreepers and Black-chinned Honeyeaters are now rarely sighted. Striated Pardalotes, Jacky Winters and Restless Flycatchers frequent the site, but only in small numbers. Crested Shrike-tits and Double-barred Finches are recorded regularly within the Reserve. The White-bellied Cuckoo-shrike and White-winged Triller remain rare. Speckled Warblers, although in decline, are still frequently encountered.

Many authors (Benson and Howell 1990; Recher *et al.* 1993; Rosen 1995) have documented the demise of native forests/woodlands on the Cumberland Plain after the arrival of European settlers. Major changes occurred as a consequence of urbanization, agricultural pursuits, logging, changed fire regimes and the introduction of exotic plants and animals. Unfortunately the

Reserve has suffered from the influences of all these at some stage.

Urbanization has now encroached upon a majority of the Reserve's boundaries. The southern boundary is the only one to lie adjacent to unoccupied Crown Land. Over recent times most intensive farming practices have been restricted to areas outside the Reserve although horses and/or cattle were allowed to graze within the Reserve during most years since 1965. This has caused a reduction in grass cover. Horses have added greatly to the formation of a myriad of tracks throughout the Reserve and they were also responsible for ringbarking hundreds of Grey Box trees (I. Hancock, pers. comm.). Even though the Reserve must have been logged in the not too distant past, as suggested by the uniform girth and height of most trees, there is no organized logging being carried out at present. However, many trees are still being cut illegally for firewood or landscaping material. Many exotic weed species are now found throughout the Reserve. These have been introduced largely by birds depositing seeds and via seeds in horse faeces. Except for a very small portion adjacent to where Pitt Town–Dural Road crosses Longneck Creek, none of the Reserve has been burnt since the late 1950s (H. Recher, pers. comm.). This has aided the growth of Blackthorn thickets. Dogs that run free, and trail bike riders using the many tracks cause considerable disturbance to ground feeding birds (Dufty 1990). Foxes have been sighted on numerous occasions and piles of feathers near scats indicate predation on birds. Feral cats are also present in the Reserve (H. Recher, pers. comm.).

Unfortunately areas of significant conservation value adjacent to and co-joining the Reserve are unreserved Crown Land. As more land surrounding the Reserve is cleared for residential or farming purposes further pressure will be placed on the Reserve's limited resources to sustain its avian fauna. The prospect for the continued survival of those species whose numbers are low or have declined is very tenuous.

ACKNOWLEDGMENTS

The authors would like to thank Rudi and Rebecca Jacobs, Darryl and Beatrice McKay, Stein Boddington, Bill Ebzery, Leigh Taylor, Ned Stephenson, Rebecca Irvine, Tessa Ivison, Amy Dolstra, Jill Molan and Lucy Manning, all of whom gave freely of their time in directly assisting with this project. Thanks also go to all those who, at various stages, assisted with banding at this site. They were too numerous to list individually but we would like to particularly thank Bill Lane and Jeff Hardy who co-ordinated previous banding visits and who transferred all accumulated data to us.

We also appreciated the assistance of Norma Baker, Christine Bonser, Bruce Cox, Jill Dark, Irene Denton, Em Hoskin, Ian Johnson, Alan Leishman and Anne Lindsey who passed on observation data. A special thanks to Athol Colemane and Lola Smith who allowed access to their extensive collection of sighting records.

We thank Peter Smith, Jeff Hardy and especially Stein Boddington for reading a draft of the manuscript and giving much appreciated comments and suggestions. We also highly valued the critical and constructive comments of Harry Recher and Alan Leishman.

We wish to thank the Australian Nature Conservation Agency for approving this project and supplying the bands used. Finally we wish to thank the Longneck Lagoon Trust for their support, particularly Trevor Nixon and Ian Hancock, and hope that this paper and future studies will assist in the conservation of this area.

Editor's note: Subsequent to the submission of this paper Longneck Lagoon Nature Reserve and most of the upper catchment areas of Longneck and Llewellyn Creeks have been declared as Scheyville National Park.

REFERENCES

Anon. (1967). Recovery Round-up. *Aust. Bird Bander* **5**: 17.

Anon. (1974). Recovery Round-up. *Aust. Bird Bander* **12**: 17.

Anon. (1975 and 1975a). Recovery Round-up. *Aust. Bird Bander* **13**: 39.

Anon. (1986). Recovery Round-up. *Corella* **10**: 131.

Antcliff, P. (1989a). Conservation and management strategy for the remnant vegetation of north-west Sydney. *National Parks Journal* **33**: 10–14.

Antcliff, P. (1989b). Conservation and management strategy for the remnant vegetation of north-west Sydney — Part II. *National Parks Journal* **33**: 21–24.

Antcliff, P. (1991). Birds and mammals of north-west Sydney. In 'Urban Bushland in Western Sydney — Proceedings of a seminar held at Werrington Campus University of Western Sydney'. (Nature Conservation Council of New South Wales: Sydney).

Barker, R. D. and Vestjens, W. J. M. (1984). 'The Food of Australian Birds. 2. Passerines'. (Melbourne University Press: Melbourne.)

Benson, D. H. (1992). The natural vegetation of the Penrith 1:100 000 map sheet. *Cunninghamia* **2**: 541–596.

Benson, D. H. and Howell, J. (1990). 'Taken for granted: the bushland of Sydney and its suburbs'. (Kangaroo Press: Sydney.)

Blakers, M., Davies, S. J. J. F. and Reilly, P. N. (1985). 'The Atlas of Australian Birds'. (Royal Australasian Ornithologists Union: Melbourne.)

Boehm, E. F. (1982). Results from banding Brown Tree-creepers. *Corella* **6**: 16–17.

Cohn, J. and Hastings, S. (1994). 'The conservation of natural vegetation remnants in southern Hawkesbury City Council Local Government Area'. (Save the Bush Project No. MZ08, Aust. Nature Conservation Agency: Canberra.)
Douglas, P. and Wilson, P. (1985). 'Proposed Longneck Lagoon Nature Reserve'. (NSW National Parks and Wildlife Service: Sydney.)
Dufty, N. (1990). Longneck Lagoon — Past, Present and Future. *National Parks Journal* **34**: 23–26.
Hardy, J. W. (1983). 'Weights and Measurements — Superb Fairy-wren and Variegated Fairy-wren'. In Data Exchange, *Corella* **7**: 48.
Hardy, J. W. and Farrell, J. R. (1990). A bird banding study in the Blue Mountains, New South Wales. 1. Overview. *Corella* **14**: 1–15.
Hoskin, E. S. (Hindwood, K. A. and McGill, A. R.) (1991). 'The Birds of Sydney, County of Cumberland, New South Wales, 1770–1989 (revised edition)'. (Surrey Beatty & Sons: Sydney.)
Keast, A. (1995). Habitat loss and species loss: the birds of Sydney 50 years ago and now. *Aust. Zool.* **30**: 3–25.
Kinhill Engineers Pty Ltd (1990). 'Scheyville Environmental Report — Scheyville Natural Habitat Study', Ultimo.
Lamm, D. W. and Wilson, S. J. (1966). Seasonal fluctuations of birds in the Brindabella Range, Australian Capital Territory. *Emu* **65**: 183–207.
Lane, S. G. (1974). Soft part colours in Fuscous Honeyeaters. *Aust. Bird Bander* **12**: 55–57.
Loyn, R. H. (1986). The 20 minute search — a simple method for counting forest birds. *Corella* **10**: 58–60.
Marchant, S. (1992). 'A Bird Observatory at Moruya, New South Wales. 1975–84. Occasional Publication No. 1. Eurobodalla Natural History Society'. (Moruya Commercial Printery: Moruya.)
Recher, H. F. (1989). Foraging segregation of Australian warblers (Acanthizidae) in open forest near Sydney, New South Wales. *Emu* **89**: 204–215.
Recher, H. F. (1991). Conservation and management of eucalypt forest birds: resource requirements for nesting and foraging. In 'Conservation of Australia's Forest Fauna' Ed. by D. Lunney. Roy. Zool. Soc. New South Wales (Surrey Beatty and Sons: Chipping Norton).
Recher, H. F., Hutchings, P. A. and Rosen, S. (1993). The biota of the Hawkesbury–Nepean catchment: reconstruction and restoration. *Aust. Zool.* **29**: 3–41.
Recher, H. F. and Majer, J. D. (1994). On the selection of tree species by Acanthizidae in open-forest near Sydney, New South Wales. *Emu* **94**: 239–245.
Roberts, P. (1993). 'Birdwatcher's Guide to the Sydney Region'. (Kangaroo Press Pty Ltd: Kenthurst.)
Rosen, S. (1995). 'Losing ground: an environmental history of the Hawkesbury–Nepean catchment'. (Hale and Iremonger: Sydney.)
Slater, P., Slater, P. and Slater, R. (1986). 'The Slater Field Guide to Australian Birds'. (Rigby: Sydney.)
Tidemann, S. C., Wilson, S. J. and Marples, T. G. (1988). Some results from a long-term bird-banding project in the Brindabella Range, ACT. *Corella* **12**: 1–6.

AN UNUSUAL PLUMAGE FOR A SOOTY SHEARWATER *Puffinus griseus*

The discovery of a Sooty Shearwater breeding on Lion Island, in Broken Bay, New South Wales on 2 February 1947 was recorded by Keast and McGill (1948).

During a survey of seabird species conducted on Lion Island, a number of Sooty Shearwaters were found and 33 were banded. Slight variation in the amount of grey-white underwing was evident but most were greyish or off-white. I banded a further 20 Sooty Shearwaters on coastal New South Wales islands over the years. The underwing colouring was always grey-brown with the centre rather indistinct paler grey or off-white.

However, on Lion Island, one bird (band no. 160–04864) found in a burrow had 'almost entirely white underwings' as recorded in my field note book. It was strikingly white, was slightly smaller than its mate but it was undoubtedly a Sooty Shearwater. Its measurements were as follows:

Wing length	308 mm
Tarsus length	57 mm
Bill length	39.5 mm

This bird was in the burrow with its mate (160–00415), a 'typical' Sooty Shearwater, on 20 December 1958. It was recorded 'in burrow on egg' on 10 January 1959. The burrow was empty when checked during a visit on 21–22 March 1959, and there were no further records of either bird.

REFERENCE

Keast, J. A. and McGill, A. R. (1948). The Sooty Shearwater in Australia. *Emu* **47**: 199–202.

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