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Trends in avian diversity and abundance in remnant vegetation in inland eastern Australian farmland between 2014 and 2023

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Abstract

Australian bird communities fluctuate greatly in composition and abundance in response to rainfall. At the same time, increasing numbers of threatened bird species are declining in abundance and range, due to various threatening processes. An opportunity to study the dynamics of avian communities in inland eastern Australia arose when birds were surveyed in remnant floodplain vegetation on cotton farms in spring (September–November) 2014 and again in spring 2023, mostly at the same sites (197 sites in 2014, 195 in 2023 and 167 in common). Sites were censused twice on different mornings by separate observers in both years, with 133 diurnal landbird species and 4384 individuals recorded in 2014, and 151 species and 8227 individuals in 2023. Mean (± SE) species richness and total abundance of landbirds were 10.9 ± 0.03 and 22.3 ± 0.08 per 2-ha site, respectively, in 2014, and 17.8 ± 0.04 and 42.4 ± 0.13 per site, respectively, in 2023. Birds were almost twice as abundant in 2023 as 2014, likely attributable to 3 years of above-average rainfall in 2020–22. By contrast, the 2014 surveys were preceded by 1.5 years of average or below-average rainfall. Most (104) of the 126 species recorded in both years were more frequent in 2023 than 2014. Of concern, however, were four sedentary and 'declining' woodland species in south-eastern Australia that were either not recorded in 2023 or were less widespread or abundant than in 2014: Speckled Warbler,* Varied Sittella, Crested Shriketit and Crested Bellbird. Introduced species were also more prevalent in 2023 than 2014, with Common Myna increasing greatly in the intervening 9 years. Our findings accord with the rainfall-driven variability of Australian bird communities, help prioritise the species most in need of recovery interventions, and focus attention on the impact of the rapid increase of the Common Myna in inland eastern Australia.

* Latin names in Table 1 at end of this paper.

Introduction

Australian inland woodland, shrubland and grassland bird communities fluctuate greatly in composition and abundance in response to variable rainfall, increasing in abundance and richness in wet periods (Pascoe et al. 2021; Recher and Davis 2014; Reid et al. 2024; Smith 2015). The recent unusual triple La Niña in 2020–2022 (Voiland 2023) presented an opportunity to compare the impact of this 3-year wet period on the bird community in remnant semiarid woodland and grassland floodplain vegetation in inland eastern Australia, with a similar survey conducted in 2014 after a 20-month dry period. At the same time, increasing numbers of bird species are being listed under state and Commonwealth legislation as threatened with extinction. In addition, many woodland bird species in south-eastern Australia have been identified as 'declining' (Reid 1999). Not only is the number of threatened bird species in Australia steadily increasing but, between 1985 and 2018, the relative abundance of threatened bird species decreased by an average of 60% (Cresswell et al. 2021). Of interest, therefore, is whether populations of threatened and declining bird species are able to recover during wet periods such as the recent triple La Niña. Also of interest is whether wet periods are similarly advantageous to introduced bird species, since invasive species are the principal threat to flora and fauna species listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; Cresswell et al. 2021).

This paper reports the abundance and richness of birds in remnant floodplain vegetation in inland eastern Australia resulting from two surveys, one in 2014 and the second in 2023, with a particular focus on threatened and declining species, as well as introduced species.

Methods

Birds were surveyed in remnant vegetation (riparian forests, woodlands, tall shrublands and native and derived grasslands) and in native revegetation on floodplain cotton farms from central Queensland to southern New South Wales between 25 September and 29 November 2014, and between 22 September and 22 November 2023. Farms were clustered in four zones (from north to south): (1) central Queensland (Fitzroy River basin) in the Emerald district; (2) Border Rivers, comprising the Condamine–Culgoa River basin in southern Qld and the Macintyre, Gwydir and Namoi River catchments in north-western NSW, centred on Moree; (3) Macquarie River basin in central NSW around Trangie, and (4) southern NSW consisting of the Lachlan and Murrumbidgee catchments, centred around Griffith. A distance of approximately 1300 km separated the northern sites near Emerald in central Qld and the southern sites near Coleambally in southern NSW.

The climate of the three northern zones is humid subtropical (Cfa) grading into semiarid (BSh) in the Köppen–Geiger system, whereas the southern NSW zone is cold semiarid (BSk; Peel et al. 2007). Mean annual rainfall between 2000 and 2023 varied from 567 mm and 564 mm at Emerald and Moree, respectively, to 471 mm at Trangie and 289 mm in Griffith. By analysing Bureau of Meteorology rainfall data for weather stations in each zone in survey years and the 3 preceding years, we determined that both survey years were similarly dry (38–72% and 35–76% of mean annual rainfall falling in the 8 months prior to the September–November survey period in 2014 and 2023, respectively). However, seasonal conditions in the 3 years preceding the survey years differed. Annual rainfall across the region was 98–116% of mean annual rainfall in 2011–13 compared to 115–156% in 2020–22. The latter was an unusual 3-year 'Triple-Dip La Niña' wet period (Voiland 2023).

Land use in all four zones is predominantly irrigated and dryland cropping and extensive livestock grazing of native pastures and woodlands, although some remnant vegetation on irrigated farms in all zones is ungrazed by domestic livestock. In 2014, the 197 sites surveyed were all on cotton farms, whereas 22 of

the 195 sites surveyed in 2023 were on public land (travelling stock routes, national parks, nature reserves). These and six other sites on cotton farms were substituted for sites that were unable to be surveyed in 2023 due to changes in ownership or vegetation clearance, and were selected to sample vegetation types more evenly; 167 sites were common to both surveys.

Sites were classified into nine types by vegetation structure, dominant plant species and as remnant native vegetation or native (planted) revegetation: (1) river red gum (*Eucalyptus camaldulensis*) forest and woodland; (2) coolibah (*E. coolabah*) woodland; (3) black box (*E. largiflorens*) woodland; (4) poplar box (*E. populnea*) woodland; (5) myall (*Acacia pendula*) tall open shrubland; (6) belah (*Casuarina cristata*) forest and low-forest; (7) brigalow (*A. harpopyhlla*) low-forest; (8) grassland; (9) native revegetation of trees or trees and shrubs (planted 2–35 years ago). The structure and composition of each vegetation type is described in more detail by Smith et al. (2019).

Sites consisted of a 2-ha (generally 200 × 100 m) quadrat in a target vegetation type, generally contiguous with similar vegetation on at least two sides and sometimes all four. Birds at each site were censused twice on different mornings for 20 mins between sunrise and 11:00 hrs by separate observers in 2014 (JR and S. Green) and 2023 (JR and NR). Weather conditions were generally fine and sunny or overcast and still or with a breeze or light wind during both survey periods. Very windy conditions and rain were avoided. All birds seen or heard in the 2-ha quadrat were recorded. Data were averaged over the two censuses per quadrat in each survey period. Avian nomenclature follows Christidis and Boles (2008), and threatened bird species categories were as per Commonwealth and NSW legislation in December 2024, and applied retrospectively to species recorded in the 2014 and 2023 surveys.

Results

Some 133 diurnal landbird species and 4384 individuals were recorded in 2014, and 151 species and 8227 individuals in 2023 (Table 1). Mean (± SE) species richness and total abundance of landbirds were 10.9 ± 0.03 and 22.3 ± 0.08 per site, respectively, in 2014, and 17.8 ± 0.04 and 42.4 ± 0.13 per site, respectively, in 2023. Birds were almost twice as abundant in 2023 as 2014, and mean species richness one and half times greater in 2023 than 2014. Seven species were recorded in 2014 but not 2023: Scaly-breasted Lorikeet, Budgerigar, Pallid Cuckoo, White-fronted Honeyeater, Varied Sittella, Rufous Fantail and Little Crow. By contrast, 25 species were recorded in 2023 but not 2014. Most (126) species were recorded in both years, and 82 of these species were recorded in at least three more sites in 2023 than in 2014. By contrast, only six species were recorded in at least three more sites in 2014 than in 2023.

Consistent with the results for native species, introduced bird species were more widespread and abundant in 2023 than 2014 (Table 1). Only three introduced species were recorded in 2014: Rock Dove (n = 2 sites), Common Starling (11) and Common Myna (1). These species were recorded in many more sites in 2023 (10, 26 and 24 sites, respectively), particularly Common Myna. Spotted Dove, Common Blackbird and House Sparrow were also recorded in one or two sites each in 2023.

Also consistent with avian diversity and abundance comparisons between the 2 years, most threatened and declining woodland bird species were more diverse, frequent and abundant in 2023 than 2014 (Table 1). Fourteen species listed as Vulnerable or Endangered under the *Biodiversity Conservation Act 2016* (NSW) or the EPBC Act (Cwth), or both, were recorded in 2023 compared to 13 in 2014. Two listed species were recorded in 2023 but not in 2014 (Little Lorikeet, White-fronted Chat), whereas only one listed species was recorded in 2014 but not 2023 (Varied Sittella). Ten of the 12 listed species recorded in both years were both more frequent and abundant in 2023 than 2014, and paired t-tests comparing both the frequency and

abundance (log-transformed) of the 12 species in the 2 years were significant ($P = 0.009$ and $P = 0.002$, respectively).

Twenty-seven declining woodland bird species were recorded in the two surveys (including seven of the listed species mentioned above). Twenty-six declining woodland species were recorded in 2023 compared to only 23 species in 2014 (Table 1). Eighteen of the 22 declining species recorded in both years were both more frequent and more abundant in 2023 than 2014. Paired t-tests comparing both the frequency and abundance (log-transformed) of the 22 species between the two years were significant ($P = 0.002$ and $P = 0.004$, respectively).

Discussion

We attribute the large increase in local and subcontinental-scale species richness and abundance of birds in 2023 compared to 2014 to the three La Niña years of above-average rainfall in 2020–22. Rainfall was well above average in the three southern zones in all 3 years between 2020 and 2022 (115–219% of mean annual rainfall), with only the 2021 rainfall at Emerald falling below average (90% of mean annual rainfall). By contrast, and despite above-average rainfall in 2011 and 2012 throughout all four zones (110–149% and 105–143% of mean annual rainfall, respectively), rainfall was well below average in 2013 (69–88%) in the year preceding the 2014 survey. The dry conditions from January to August in 2014 preceding the survey, coupled with the dry 2013, were sufficient to suppress avian abundance and diversity, whereas the dry start to 2023 was insufficient to dampen the increased population sizes and habitat spill-overs evident in the 2023 surveys. The general increases in population abundances and habitat spill-overs in these semi-arid woodland and grassland habitats in 2023 were likely due to increased food abundance, breeding and breeding success in 2020–22 compared to 2013–14 (Recher and Davis 2014; Smith 2015; Stevens and Watson 2013).

Of interest are the seven species recorded in both years that were not more abundant and widely dispersed in 2023 than 2014: Australian Hobby, Nankeen Kestrel, Horsfield's Bronze-Cuckoo, Crested Bellbird, Little Crow, Zebra Finch and Australasian Pipit. Several of these are mobile species often found commonly in arid Australia in good seasons and prefer some non-vegetated ground for foraging; hence part or all of the kestrel, cuckoo, crow, finch and pipit populations might have relocated inland during the three La Niña years and continued to reside there during the 2023 survey.

The increase in avian abundance and local species richness in 2023 was generally evident among listed and declining woodland bird species, indicating that the excellent seasonal conditions in 2020–22 counteracted the various threatening processes responsible for these species' declines in historical times. However, eight threatened and/or declining species recorded in 2014 were either not recorded in 2023, or were less abundant or frequent in 2023 than 2014: Spotted Harrier, Superb Parrot, Horsfield's Bronze-Cuckoo, Speckled Warbler, Painted Honeyeater, Varied Sittella, Crested Shriketit and Crested Bellbird. While part of the populations of some of these species may have resided further inland in more arid habitats in 2023 for the reasons mentioned above (harrier, parrot, cuckoo), the reduced abundance or frequency of the more sedentary species (warbler, sittella, shriketit, bellbird) is a concern. It could indicate that the threatening processes contributing to their decline are having a greater influence than the positive effect of prolonged high rainfall. As the Painted Honeyeater is dependent on mistletoe fruit for food, part of its population, too, may have relocated to more arid habitats in 2023 if excellent seasonal conditions promoted an unusually large fruit resource further inland.

Although introduced bird species were more frequent or abundant in 2023 than 2014, in common with most other species, the increase in Common Mynas was startling. Only two birds were recorded in one site in

2014, whereas 102 birds were recorded across 26 sites in 2023. The Invasive Species Specialist Group, a specialist group of the Species Survival Commission of the World Conservation Union, declared this species to be one of the world's most invasive species, listing it with only two other bird species in '100 of the World's Worst Invasive Species' (Lowe et al. 2004). The species is spreading rapidly in inland eastern Australia.

Conclusions/Implications

Our findings support the notion that above-average rainfall is an important driver of breeding success and population increase in semi-arid Australian bird communities. The threatened and declining sedentary species that showed the reverse trend (Speckled Warbler, Varied Sittella, Crested Shriketit, Crested Bellbird) deserve special conservation attention. Research is also required to assess the environmental impact of the rapid expansion of the Common Myna in inland eastern Australia.

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Table 1. The frequency (Freq), total number (Total no.) and conservation status of diurnal landbirds recorded in censuses in native floodplain vegetation in inland eastern Australian farmland in September–November 2014 and 2023. Frequency is the per cent occurrence of species across all sites in 2014 (n = 197 sites) and 2023 (n = 195).

English name	Scientific name	Conser-vation status*	2014		2023	
			Freq (%)	Total no.	Freq (%)	Total no.
Emu	*Dromaius novaehollandiae*	D	0.0	0	0.5	2
Australian Brush-turkey	*Alectura lathami*		0.0	0	0.5	1
Stubble Quail	*Coturnix pectoralis*		0.0	0	3.6	22
Brown Quail	*Coturnix ypsilophora*		0.5	2	10.8	116
**Rock Dove	*Columba livia*		1.0	9	5.1	45
**Spotted Dove	*Streptopelia chinensis*		0.0	0	1.0	6
Common Bronzewing	*Phaps chalcoptera*		1.5	4	5.1	25
Crested Pigeon	*Ocyphaps lophotes*		56.3	410	56.4	436
Diamond Dove	*Geopelia cuneata*		0.0	0	1.0	9
Peaceful Dove	*Geopelia striata*	D	14.2	62	23.6	225
Bar-shouldered Dove	*Geopelia humeralis*		4.6	14	12.8	60
Black-shouldered Kite	*Elanus axillaris*		3.0	11	7.7	21
Pacific Baza	*Aviceda subcristata*		0.5	1	1.0	3
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	0.5	1	1.5	5
Whistling Kite	*Haliastur sphenurus*	D	10.7	36	14.9	53
Black Kite	*Milvus migrans*		8.6	31	13.8	47
Brown Goshawk	*Accipiter fasciatus*		0.5	2	2.1	5
Collared Sparrowhawk	*Accipiter cirrocephalus*		0.5	1	1.5	4
Spotted Harrier	*Circus assimilis*	V	0.5	1	0.5	1
Wedge-tailed Eagle	*Aquila audax*		1.5	4	2.1	4
Nankeen Kestrel	*Falco cenchroides*		12.2	31	9.2	26
Brown Falcon	*Falco berigora*		1.5	3	2.1	6
Australian Hobby	*Falco longipennis*		3.6	7	2.1	4
Black Falcon	*Falco subniger*	V	0.5	1	1.0	3
Painted Button-quail	*Turnix varius*	D	0.0	0	0.5	1
Little Button-quail	*Turnix velox*		0.0	0	1.0	2
Galah	*Eolophus roseicapillus*		34.0	382	41.5	515
Long-billed Corella	*Cacatua tenuirostris*		0.0	0	0.5	4
Little Corella	*Cacatua sanguinea*		4.1	46	13.8	133
Sulphur-crested Cockatoo	*Cacatua galerita*		24.4	383	42.1	650
Cockatiel	*Nymphicus hollandicus*		6.6	40	33.8	280
Rainbow Lorikeet	*Trichoglossus haematodus*		1.0	7	4.6	60
Scaly-breasted Lorikeet	*Trichoglossus chlorolepidotus*		0.5	2	0.0	0
Musk Lorikeet	*Glossopsitta concinna*		2.0	59	1.0	4
Little Lorikeet	*Glossopsitta pusilla*	V	0.0	0	0.5	6
Australian King-Parrot	*Alisterus scapularis*		0.5	2	1.0	6
Red-winged Parrot	*Aprosmictus erythropterus*		7.6	28	12.3	40
Superb Parrot	*Polytelis swainsonii*	V, VN	2.5	97	6.2	70
Yellow Rosella	*Platycercus flaveolus*		1.0	12	3.6	29
Eastern Rosella	*Platycercus eximius*		9.6	82	18.5	167
Pale-headed Rosella	*Platycercus adscitus*		14.2	56	29.2	157
Australian Ringneck	*Barnardius zonarius*		11.2	68	14.9	95
Blue Bonnet	*Northiella haematogaster*		18.3	224	23.1	200
Red-rumped Parrot	*Psephotus haematonotus*		24.9	225	28.7	336
Mulga Parrot	*Psephotus varius*		0.0	0	1.0	4
Budgerigar	*Melopsittacus undulatus*		1.0	4	0.0	0
Pheasant Coucal	*Centropus phasianinus*		2.0	4	4.1	11

Channel-billed Cuckoo	*Scythrops novaehollandiae*		0.5	2	3.6	9
Horsfield's Bronze-Cuckoo	*Chalcites basalis*	D	5.6	12	2.6	6
Shining Bronze-Cuckoo	*Chalcites lucidus*		0.5	1	0.5	1
Little Bronze-Cuckoo	*Chalcites minutillus*		1.0	2	1.0	2
Pallid Cuckoo	*Cacomantis pallidus*		0.5	1	0.0	0
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	D	0.0	0	0.5	1
Laughing Kookaburra	*Dacelo novaeguineae*		12.2	39	15.9	55
Blue-winged Kookaburra	*Dacelo leachii*		0.5	1	1.5	9
Forest Kingfisher	*Todiramphus macleayii*		0.5	2	2.1	7
Sacred Kingfisher	*Todiramphus sanctus*		17.8	97	24.6	153
Rainbow Bee-eater	*Merops ornatus*		1.0	2	8.2	43
Dollarbird	*Eurystomus orientalis*		4.1	16	4.6	17
Brown Treecreeper	*Climacteris picumnus*	V, VN, D	8.1	64	13.8	117
Spotted Bowerbird	*Ptilonorhynchus maculatus*		2.5	6	5.6	11
Superb Fairy-wren	*Malurus cyaneus*		18.3	338	37.4	827
Red-backed Fairy-wren	*Malurus melanocephalus*		6.1	72	7.2	113
White-winged Fairy-wren	*Malurus leucopterus*		8.1	96	23.6	300
Purple-backed Fairy-wren	*Malurus assimilis*		22.8	292	42.6	637
White-browed Scrubwren	*Sericornis frontalis*		0.5	8	1.0	10
Speckled Warbler	*Chthonicola sagittata*	V, D	1.5	6	1.5	6
Weebill	*Smicrornis brevirostris*		24.4	204	24.6	281
Western Gerygone	*Gerygone fusca*		6.6	28	14.4	71
White-throated Gerygone	*Gerygone albogularis*		2.5	9	8.2	27
Yellow Thornbill	*Acanthiza nana*		10.2	146	14.9	165
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*		10.7	102	14.4	102
Chestnut-rumped Thornbill	*Acanthiza uropygialis*	D	4.6	57	10.8	62
Buff-rumped Thornbill	*Acanthiza reguloides*	D	0.0	0	0.5	2
Inland Thornbill	*Acanthiza apicalis*		2.0	20	1.5	9
Brown Thornbill	*Acanthiza pusilla*		0.0	0	1.0	2
Southern Whiteface	*Aphelocephala leucopsis*	V, VN, D	0.5	2	1.0	4
Spotted Pardalote	*Pardalotus punctatus*		0.5	1	1.0	5
Striated Pardalote	*Pardalotus striatus*		25.4	116	39.5	278
Lewin's Honeyeater	*Meliphaga lewinii*		0.0	0	3.1	13
Singing Honeyeater	*Lichenostomus virescens*		8.1	50	15.4	180
White-plumed Honeyeater	*Lichenostomus penicillatus*		28.4	511	34.4	855
White-fronted Honeyeater	*Purnella albifrons*		0.5	2	0.0	0
Noisy Miner	*Manorina melanocephala*		28.9	627	37.9	1140
Yellow-throated Miner	*Manorina flavigula*		32.0	416	36.9	781
Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*		10.7	49	11.8	65
Crimson Chat	*Epthianura tricolor*		0.0	0	1.0	14
White-fronted Chat	*Epthianura albifrons*	V	0.0	0	0.5	13
Brown Honeyeater	*Lichmera indistincta*		4.1	24	10.8	90
Black-chinned Honeyeater	*Melithreptus gularis*	V	0.5	2	1.0	4
Brown-headed Honeyeater	*Melithreptus brevirostris*		0.5	3	1.5	8
White-throated Honeyeater	*Melithreptus albogularis*		3.0	32	4.6	70
Blue-faced Honeyeater	*Entomyzon cyanotis*		10.2	41	20.5	100
Noisy Friarbird	*Philemon corniculatus*		6.6	21	10.8	112
Little Friarbird	*Philemon citreogularis*		32.0	299	43.1	457
Striped Honeyeater	*Plectorhyncha lanceolata*		9.6	41	26.7	175
Painted Honeyeater	*Grantiella picta*	V, VN	3.6	13	3.6	15
Grey-crowned Babbler	*Pomatostomus temporalis*	V, D	9.6	85	13.3	118
Varied Sittella	*Daphoenositta chrysoptera*	V, D	0.5	5	0.0	0
Ground Cuckoo-shrike	*Coracina maxima*	D	0.5	1	1.0	6
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*		24.4	80	44.6	221
White-bellied Cuckoo-shrike	*Coracina papuensis*	D	4.1	11	4.6	16
White-winged Triller	*Lalage sueurii*	D	9.6	28	10.3	36
Crested Shrike-tit	*Falcunculus frontatus*	D	2.0	7	2.1	4

Golden Whistler	*Pachycephala pectoralis*		1.0	2	1.0	3
Rufous Whistler	*Pachycephala rufiventris*	D	12.7	72	31.8	156
Grey Shrike-thrush	*Colluricincla harmonica*		16.8	57	26.7	126
Crested Bellbird	*Oreoica gutturalis*	D	2.0	5	0.5	1
Australasian Figbird	*Sphecotheres vieilloti*		0.5	1	0.5	11
Olive-backed Oriole	*Oriolus sagittatus*		5.6	18	7.2	18
White-breasted Woodswallow	*Artamus leucorynchus*		10.7	54	12.3	58
Masked Woodswallow	*Artamus personatus*		2.5	14	3.6	53
White-browed Woodswallow	*Artamus superciliosus*	D	5.1	82	7.7	180
Black-faced Woodswallow	*Artamus cinereus*		0.5	5	1.5	5
Dusky Woodswallow	*Artamus cyanopterus*	V, D	3.0	9	4.6	18
Little Woodswallow	*Artamus minor*		0.0	0	1.5	7
Grey Butcherbird	*Cracticus torquatus*		23.4	101	32.3	176
Pied Butcherbird	*Cracticus nigrogularis*		32.0	156	45.1	205
Australian Magpie	*Cracticus tibicen*		37.6	188	49.2	271
Pied Currawong	*Strepera graculina*		0.5	1	0.5	1
Spangled Drongo	*Dicrurus bracteatus*		0.0	0	0.5	1
Rufous Fantail	*Rhipidura rufifrons*		0.5	1	0.0	0
Grey Fantail	*Rhipidura albiscapa*		3.6	13	10.3	35
Willie Wagtail	*Rhipidura leucophrys*		32.0	225	47.2	379
Australian Raven	*Corvus coronoides*		20.8	91	44.1	200
Little Raven	*Corvus mellori*		3.0	10	13.3	79
Little Crow	*Corvus bennetti*		1.5	9	0.0	0
Torresian Crow	*Corvus orru*		8.1	30	16.4	77
Leaden Flycatcher	*Myiagra rubecula*		1.0	3	4.6	25
Restless Flycatcher	*Myiagra inquieta*	D	6.6	22	12.8	62
Magpie-lark	*Grallina cyanoleuca*		35.0	183	52.3	297
White-winged Chough	*Corcorax melanorhamphos*		7.6	89	7.7	203
Apostlebird	*Struthidea cinerea*		11.7	224	12.8	361
Jacky Winter	*Microeca fascinans*	D	9.1	29	14.9	89
Red-capped Robin	*Petroica goodenovii*	D	1.5	4	5.6	29
Hooded Robin	*Melanodryas cucullata*	E, EN, D	0.5	3	2.6	11
Eastern Yellow Robin	*Eopsaltria australis*	D	3.0	17	4.6	27
Horsfield's Bushlark	*Mirafra javanica*		3.0	24	2.6	9
Golden-headed Cisticola	*Cisticola exilis*		0.5	4	4.6	39
Australian Reed-Warbler	*Acrocephalus australis*		0.0	0	0.5	2
Tawny Grassbird	*Megalurus timoriensis*		0.0	0	4.6	14
Rufous Songlark	*Cincloramphus mathewsi*		2.5	16	6.2	23
Brown Songlark	*Cincloramphus cruralis*		0.0	0	1.5	5
Silvereye	*Zosterops lateralis*		2.5	47	7.7	56
Welcome Swallow	*Hirundo neoxena*		5.1	23	15.9	66
Fairy Martin	*Petrochelidon ariel*		7.6	75	17.4	247
Tree Martin	*Petrochelidon nigricans*	D	9.1	91	22.6	335
**Common Blackbird	*Turdus merula*		0.0	0	0.5	1
**Common Starling	*Sturnus vulgaris*		5.6	74	12.3	136
**Common Myna	*Sturnus tristis*		0.5	2	13.3	102
Mistletoebird	*Dicaeum hirundinaceum*		24.4	141	33.3	200
Zebra Finch	*Taeniopygia guttata*		4.1	47	2.6	41
Double-barred Finch	*Taeniopygia bichenovii*		5.6	50	7.7	105
Plum-headed Finch	*Neochmia modesta*	D	0.0	0	2.6	67
Red-browed Finch	*Neochmia temporalis*		0.0	0	0.5	3
Chestnut-breasted Mannikin	*Lonchura castaneothorax*		0.5	2	0.5	30
**House Sparrow	*Passer domesticus*		0.0	0	0.5	1
Australasian Pipit	*Anthus novaeseelandiae*		4.1	12	1.5	3

* Conservation status: D, declining (Reid 1999); E, Endangered, and V, Vulnerable in NSW (NSW Biodiversity Conservation Act); EN, Endangered nationally, and VN, Vulnerable nationally (Cwth EPBC Act 1999)
** Introduced species