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BIRD CENSUSES FROM DESERT LOCALITIES IN WESTERN AUSTRALIA

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SUMMARY

PIANKA, H. D. and E. R. 1970. Bird censuses from desert localities in Western Australia. Emu 70: 17-22. Bird censuses for eight localities in the deserts of Western Australia are presented. The total number of species in the areas varies from 11 to 35. The occurrence of certain species is discussed with reference to habitats and other environmental conditions.

INTRODUCTION

Eight study areas in the deserts of Western Australia were chosen for a 16-month field investigation which centred about the ecology of desert lizards. During these studies an effort was made to obtain a complete list of the bird species on each site. Reasonably complete censuses of the avifaunal composition of well-defined and rather remote desert areas were thus obtained, as well as locality records, some of which may be important. Censuses of the lizards on the same areas with a discussion of their habitats are being published elsewhere (Pianka in press).

Because both scientific and vernacular names of all bird species mentioned in the text are listed in Appendix II, both are not given in the text.

Whenever possible, positive identification of the birds was made by sight. Usually, repeated sightings were made. In all cases where doubt remains about any species, the bird was seen only once or under suboptimal conditions for satisfactory viewing. Distinctive calls alone were taken as sufficient evidence only for the presence of the Boobook Owl on Areas A, L and E, the Western Shrike-Thrush on Area L, and the Red-browed Pardalote on Areas G, L and E. Tracks were enough to convince us of the presence of the Emu and Bustard.

Serventy and Whittell (1967) was the most useful reference, but Cayley's (1959) illustrations were also most helpful. Condon (1966) was frequently referred to in identifying birds of prey.

STUDY AREAS

Appendix I lists the latitudes and longitudes of the study areas and the dates when each was visited (see also Fig. 1).

Area N

This area is a treeless flat, between 1,600 and 3,200 m across, covered almost exclusively with rather small and often reticulating clumps of *Triodea* spp. (the so-called Spinifex Grass). It is encircled by desert woodland, primarily of large (often 10 m high) evenly spaced Marble Gums *Eucalyptus gongylocarpa* with clumps of mallee eucalypts, some smaller bushes (mostly *Acacia* spp.) and a ground cover of spinifex. There is a small grove of similar composition in the centre of the flat, and a few small trees (*Grevillea, Acacia,* or mallee eucalypts) are scattered over it. The spinifex plain is lower than the surrounding woods and the central grove, these being on higher sandier ground, probably low stabilized sand dunes.

Areas G and L

Areas G and L resemble the woodland surrounding Area N and are perhaps best described as open savanna woodland. Both are on gently rolling red sand-plains. Area L contains small low-lying spinifex meadows, miniatures of Area N, with the largest trees growing on the higher ground. In Area G, the trees are better spaced, and there are no distinct treeless tracts. Both areas support many clumps of mallee eucalypts as well as prominent Marble Gums, which on area L often reach 15 m in height. Fruiting Quandong trees *Santalum acuminatum* occur in Area G, as well as in the central grove of Area N.

Areas D and E

These are in desert sand-ridge country with stabilized red sand-dunes and interdunal flats of red sand-plain or sandy loam. Area E is crossed by long high parallel sand-ridges, which are characteristic of most of the Great Victoria Desert, while on Area D the dunes are less regular and not so long. The dunes of Area E are densely vegetated with plants ranging from a few Marble Gums to large *Acacia* and *Grevillea* bushes and small perennial shrubs to spinifex and bushy annuals. In Area D the dunes are usually more sparsely vegetated, with no Marble Gums, although in places large mulga trees grow in depressions near dune-crests. The small flowering perennial bush *Thryptomene maissonneuvii* is common on the slopes and near the base of the dunes of both areas, as is the small tree *Grevillea juncifolia.* Clumps of spinifex, the major cover of interdunal flats of both

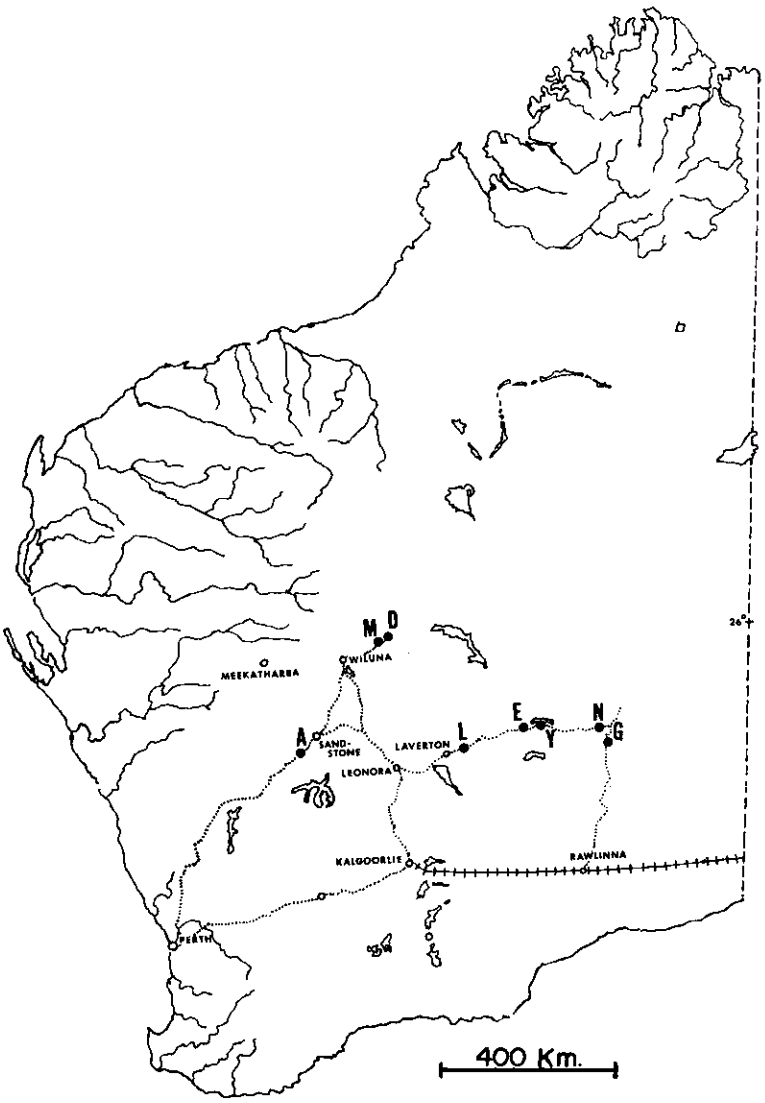

Figure 1. Map of Western Australia, showing the eight study areas.

areas, gradually give way to small bushes and annuals as one ascends the dunes.

Interdunal flats in Area E support regularly spaced Marble Gums, up to 9 or 10 m high, mallee eucalypt clumps, and scattered *Acacia* and *Grevillea* trees and bushes. Trees on the interdunes of Area D are rare and sparse; certain vistas on this area give the impression of a pure spinifex flat. However, the trees are often quite as tall as those in Area E, especially the large Bloodwoods *Eucalyptus dichromophloia*. Area D also has a few *Acacia ?sclerosperma* trees, reaching heights of 7 to 9 m. In general, the interdunal flats of Area D have a much more open upper-storey vegetation than Area E, where the flats more closely resemble Areas G and L. Large groves of mulga *Acacia aneura* commonly occur in the interdunal flats of Area E. These groves reach 800 m in width and are dense stands of trees on a harder red clay-soil, evidently wetter than the surrounding sands. Only a few individuals or small groups of mulga trees occur on the flats of Area D.

Areas A and M

Areas A and M both support a higher concentration of generally smaller trees than any of the other areas. The trees are predominantly mulga (both

Acacia aneura and the Broadleaf Mulga *Acacia craspedocarpa*) with mallee eucalypts being less abundant. In Area A there is another tall unidentified eucalypt, while on Area M the largest tree is *Acacia ?sclerosperma*. Both of these trees reach 6 to 9 m, but neither attains the proportions of Marble Gums on other areas. Areas A and M have a prominent but often interrupted ground-cover of spinifex and various *Acacia* shrubs. In contrast to the open savanna woodland of Areas G and L, Areas A and M are more dense, scrub-like, and closed-in, especially Area A. Both areas occur on red sandy loam and have irregular stretches of hard red loam.

Area Y

Area Y is on an extensive, almost treeless, dry lakebed, and is part of the larger Lake Yeo of most maps. The vegetation consists of small to medium-sized shrubs, mainly chenopodaceous, rarely reaching 1 m in height. There are a few mulga groves or isolated mulga trees throughout the lakebed, which is surrounded by clumps of mulga trees and mulga woodland.

It should be emphasized that the simple treeless parts of Areas N and Y were the subjects of interest in this study, and no special attempt was made to assess the avifauna of the bordering woodlands. However, the occurrence of birds on these flats was doubtless influenced by the nearby woods.

Permanent artificial sources of water lay within 2 to 3 km of Areas A, D and Y, but the windmill on Area Y was dismantled in November 1967. There were a windmill and tank about 16 km from Area L, and also less than 16 km from Area M. Area E was about 32 km from the windmill and tank on Area Y.

CENSUSES

Appendix II lists the bird species identified in the different areas. All the birds observed on an area are included. Although we have included a category of expected (E) species, we use this only to indicate those birds that were seen nearby in very similar habitat, and were probably not discovered on the area proper merely because of chance. Other species were certainly expected because of habitat considerations, ecology and geographical range, but were never observed (such as the Brown Hawk on Area D, an *Amytornis* and at least one *Malurus* sp. on Area N, etc.).

The identification of nocturnal birds was difficult, and the list for every locality is doubtless incomplete (except possibly for Areas E and L). Diurnal species also could have been missed, although in most areas such birds must have been rare, highly cryptic, or wary to escape sighting (for example, a quail-thrush or goshawk). We spent the least time on Areas Y and N, and had the distinct impression that birds in general were less abundant there than elsewhere. The lists for these two areas are certainly incomplete.

Breeding was accepted only if a nest, eggs or young were found, or nesting or mating activity observed. Many species were certainly nesting in areas where no specific evidence was obtained.

DISCUSSION

Because most Australian birds are classified as residents (Serventy and Whittell 1967:5), there is usually no difficulty in deciding which species are permanent and which are not. However, a few migratory or nomadic species were noted in our study. In Area D a large flock of Masked Woodswallows flew through southwards on 26 August 1967, and this species was not seen afterwards. Southward migrations in the spring have frequently been reported for this species. Also in Area D on 20 August 1967 many Pied Honeyeaters arrived, not having been seen there before. They nested in the small bushy trees in the interdunes, and were often seen feeding on the dunes. The White-winged Triller first appeared in Area G on 1 October 1967, was first seen in Area E on 23 November 1967, and in Area M on 1 January 1968. A pair of Rainbowbirds was seen in Area A only once, in February 1967 shortly after the cyclone, but it is not known whether they bred. All these species are well-known migrants elsewhere in Australia.

All the study areas received heavy rains from Cyclone Elsie, which swept through Western Australia in January 1967. Before the cyclone we had visited Areas A, M, D and G. In Area G parrots, which are known to depend on water, were not observed on our first visit, although a Port Lincoln Parrot was seen some 16 km south. Shortly after the rains Port Lincon Parrots and hordes of Budgerygahs appeared in the area. On later visits we saw Princess Parrots and Scarlet-breasted Parrots, and, 30 km north (at Neale Junction) in similar habitat, many Galahs. Almost a year after Cyclone Elsie we noted that parrots and cockatoos daily flew south-west over the area towards a rocky area with stream beds about 10 to 16 km away, where there was probably surface water. These birds included a flock of Cockatiels and a possible Pink Cockatoo, both seen only once, and hence probably accidentals in the area. Many, if not all, these parrots were probably concentrated closer to this water source before the rains. Zebra Finches, also seed eaters and dependent on water, but capable of obtaining it from less accessible places, were seen in Area G before as well as after the cyclone.

The Magpie-Lark and the Magpie are listed as accidentals on Areas A and L because each was seen there only once, immediately after the cyclone. The

currawong is considered accidental to Area A because it was also seen only once, during one of our last visits to the area, and then near a windmill. Such a conspicuous and noisy bird should have been noticed earlier, had it been a regular resident.

In Areas Y and N some species certainly used the treeless parts of the flats for feeding, but no doubt nested and roosted in the surrounding trees. Hawks were observed flying slowly over these flats, clearly hunting for prey. Flocks of Cockatiels and Budgerygahs flew into the Y area, landed, foraged and flew away. The only species which probably lived entirely in the treeless flats are the wrens, chats, Pipit, Little Quail and possibly a few others, such as the Zebra Finch, which might nest in the larger shrubs. In Area N many of the species were seen only in the central grove.

Specific habitat preference probably affects the occurrence of some birds in Area E, which is mainly a sand-ridge savanna woodland vegetated with spinfex and eucalypts. Some species there are commonly associated with mulga-scrub vegetation, especially the Red-capped and Hooded Robins, the Cockatiel and the Mulga Parrot. Their occurrence is probably because of the extensive mulga tracts in the interdunes, and at least the robins most likely nested in the mulga, although they occasionally fed on the dunes. None of these four species was seen on the other dune area (D) where there are no large stands of mulga.

It is of interest that the species of *Pardalotus* difers between Areas M and D, although these are only 16 km apart, with *Pardalotus substriatus* in Area M and *rubricatus* in Area D. Both localities are within the geographical ranges of the two species (Serventy and Whittell, 1967: 373-374). The difference probably reflects a habitat preference in each species. *P. rubricatus* foraged high in the foliage of tall Bloodwoods in Area D, and the other areas where it occurred (L, E and G) had many similarly tall and well-spaced Marble Gums. In Area M *P. substriatus* fed in the much lower foliage of a mallee eucalypt. Area A is the only wooded area which did not support a pardalote. Both Areas A and M had three other small foliage-dwelling species: the Whiteface, the Weebill and the Chestnut-tailed Thornbill, all commonly associated with mulga and other desert scrub woodland and not found in open savanna woodland deserts. The occurrence of *P. substriatus* in Area M might be related to the simultaneous occurrence of the above three ecologically similar species.

Another pair of similar species which showed apparent habitat specificity in our study is the Rufous Whistler, which occurs in the mulga scrub of Areas A and M, and the Western Shrike-Thrush, which was in the eucalypt savanna woodland of Areas G and L. Similarly, *Climacteris affinis* occurred on Area A and *C. rufa* on Areas G and L, reflecting a difference in habitat preference already noted by Serventy and Whittell (1967: 369-370). The Black-capped Sittella no doubt fills the role of the treecreeper in Area M.

No species met with in our study is obviously restricted to the sand-dune habitat, as already noted by Pianka (in press). The Common Bronzewing, seen only on Areas D and E, appears as a dune species only within the limits of our choice of areas, because we saw it elsewhere in non-dune desert habitats.

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APPENDIX I

Localities with latitudes and longitudes of each of the study areas, and dates on which each was visited.

Area	Location	Latitude	Longitude	Dates Visited
A	27 km S of Atley Hs., WA	28°27′	119°05′	1966: 26–28 Nov. 5–9, 15–18 Dec. 1967: 29 Jan.–4 Feb. 18–20 Feb. 18–20 Mar. 30 Apr.–1 May. 15 Aug. 18–22, 28–29 Oct. 18–20 Nov. 29–31 Dec.
M	14 km NNE of Millrose Hs., WA	26°17′	121°00′	1966: 2, 11–14 Dec. 1967: 16–18, 28–29 Aug. 23–26 Oct., 31 Dec. 1968: 3 Jan.
G	27 km S of Neale Junction, WA	28°31′	125°50′	1967: 13–19 Jan. 27–29 Mar. 28 Sept.–1 Oct. 25–29 Nov.
L	39 km E of Laverton, WA	28°28′	122°50′	1967: 21 Feb.–1 Mar. 21–24 Mar. 2–3 May. 30 Aug.–1 Sept. 17–20 Sept. 3–4 Oct. 21–22 Nov.
E	8 km NE of Dunges Table Hill, WA	28°08′	123°55′	1967: 3–4, 6–14 May. 20–27 Sept. 22–24 Nov. 1–3 Dec.
D	32 km W of Lorna Glen Hs., WA	26°14′	121°13′	1966: 30 Nov.–1 Dec. 1967: 18–28 Aug. 26–28 Oct. 1968: 3–5 Jan.
N	13 km W of Neale Junction, WA	28°17′	125°40′	1967: 25–27 Mar. 27–28 Sept. 1–2 Oct. 24–25, 29–30 Nov.
Y	5 km E of Stony Point, WA	28°05′	124°15′	1967: 29 Mar. 4–6 May. 27 Sept. 2–3 Oct. 30 Nov.–1 Dec.

APPENDIX II

List of bird species observed and areas on which each occurred.

X: positive identification by sight
T: positive identification by tracks
C: positive identification by call or song
B: evidence of breeding in area
M: probably only migrating through area
A: accidentals, probably not usually in area or particular habitat
E: seen in similar habitat nearby and highly expected in area.
parenthesis = uncertainty.

		Areas							
		A	M	G	L	E	D	N	Y
Emu	*Dromaius novaehollandiae*	B	B	T	T	B	X		T
Little Eagle	*Hieraaetus morphnoides*	X					X		
Wedge-tailed Eagle	*Aquila audax*				X				
Spotted Harrier	*Circus assimilis*					X		X	
Grey Falcon	*Falco hypoleucos*							(X)	
Brown Falcon	*Falco berigora*	X	X	X	B	B		X	X
Little Falcon	*Falco longipennis*			X		X	(X)	X	
Nankeen Kestrel	*Falco cenchroides*	X	X	X	B	X	X	X	
Little Quail	*Turnix velox*	B	X		X	X	X	X	X
Australian Bustard	*Ardeotis australis*					E+T	T		
Common Bronzewing	*Phaps chalcoptera*					X	X		
Crested Pigeon	*Ocyphaps lophotes*	X	(C)		X		X		
Pink Cockatoo	*Cacatua leadbeateri*			(A)					
Galah	*Cacatua roseicapilla*	X	X	E	B	B	X		X
Cockatiel	*Nymphicus hollandicus*		X	A	X	X	X		X
Princess Parrot	*Polytelis alexandrae*			X				X	
Port Lincoln Parrot	*Barnardius zonarius*	X	X	X	B	B	X		
Mulga Parrot	*Psephotus varius*	B	X			X			
Scarlet-breasted Parrot	*Neophema splendida*			X					
Bourke Parrot	*Neophema bourkii*	X							
Budgerygah	*Melopsittacus undulatus*		X	B	X	X	B	X	X
Pallid Cuckoo	*Cuculus pallidus*				X				
Horsfield Bronze Cuckoo	*Chrysococcyx basalis*		(X)						
Boobook Owl	*Ninox novaeseelandiae*	C		X	C	C	X	X	
Tawny Frogmouth	*Podargus strigoides*				B	X			
Owlet-Nightjar	*Aegotheles cristatus*	X			X				
Spotted Nightjar	*Eurostopodus guttatus*				(C)	E			
Red-backed Kingfisher	*Halcyon pyrrhopygius*			X	X	X	X		
Rainbowbird	*Merops ornatus*	X							
Pipit	*Anthus novaeseelandiae*								X
Black-faced Cuckoo-Shrike	*Coracina novaehollandiae*	B	X	X	B	X	X		
White-winged Triller	*Lalage sueurii*		X	X		X			
White-browed Babbler	*Pomatostomus superciliosus*	X							
Crimson Chat	*Epithianura tricolor*			B	X	B	X		
Orange Chat	*Epithianura aurifrons*							E	
Whiteface	*Aphelocephala leucopsis*	X	X						
Weebill	*Smicrornis brevirostris*	X	X						
Chestnut-tailed Thornbill	*Acanthiza uropygialis*	X	X						
Striated Field Wren	*Calamanthus fuliginosus*								B
Striated Grass Wren	*Amytornis striatus*			B	X	B	B		
Rufous-crowned Emu-Wren	*Stipiturus ruficeps*		X				X		
Splendid Wren	*Malurus splendens*	X							
Blue-and-white Wren	*Malurus leucopterus*						X		X
Variegated Wren	*Malurus lamberti*		X			X	X		
Willie Wagtail	*Rhipidura leucophrys*	X	X	X	(X)	X	X	X	X
Red-capped Robin	*Petroica goodenovii*	B	B			X			
Hooded Robin	*Petroica cucullata*	B	X			X			
Rufous Whistler	*Pachycephala rufiventris*	X	X						
Western Shrike-Thrush	*Colluricincla rufiventris*			X	C				
Crested Bellbird	*Oreoica gutturalis*	X	X	X	X	X	X	X	X
Black-capped Sittella	*Neositta c. pileata*		X						
Rufous Treecreeper	*Climacteris rufa*			E	X				
White-browed Treecreeper	*Climacteris affinis*	B							
Mistletoebird	*Dicaeum hirundinaceum*		X			X			
Striated Pardalote	*Pardalotus substriatus*		X						
Red-browed Pardalote	*Pardalotus rubricatus*			C	C	C	X		
Pied Honeyeater	*Certhionyx variegatus*						B		
Singing Honeyeater	*Meliphaga virescens*						X		
Yellow-fronted Honeyeater	*Meliphaga plumula*	X	X	X	X	X	X	X	
White-fronted Honeyeater	*Phylidonyris albifrons*			X	X	B	B	X	
Yellow-throated Miner	*Myzantha flavigula*	X	X	X	X	X	E	X	
Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*	X	X	X	X	X			
Zebra Finch	*Poephila guttata*	B	X	X	X	B	X	X	X
Magpie-Lark	*Grallina cyanoleuca*	A							
Masked Woodswallow	*Artamus personatus*						M	X	X
Grey Woodswallow	*Artamus cinereus*	X	X	X	X	X	X	X	X
Grey Currawong	*Strepera versicolor*	A							
Pied Butcherbird	*Cracticus nigrogularis*	B	X	X	X	X	X	X	
Western Magpie	*Gymnorhina t. dorsalis*				A				
Crow	*Corvus* spp.	X	X	X	X	X	X		X
Total number of species on each area (including 'E's, excluding 'A's and 'M's)		32 A	32 M	29 G	32 L	36 E	32 D	19 N	15 Y