

# THE SUNBIRD



*Journal of the*

QUEENSLAND ORNITHOLOGICAL SOCIETY

**Volume 12, Number 1**

**May 1982**

Registered for Posting as a Periodical, Category B - Price 75 cents.

## CONTENTS

ROBERTSON, J.S. and WOODALL, P.F. Bird weights and measurements from Wellington Point, South-east Queensland . . . . .	1
McKFAN, John L. and BESTE, Hans. The nest and eggs of the Mountain Thornbill <i>Acanthiza</i> <i>katherina</i> . . . . .	9
WOODALL, P.F. White-bellied Sea-eagle feeding on freshwater turtles . . . . .	11
DEBUS, S.J.S. A record of the Red Goshawk . . . . .	14
CORBEN, Chris. Aerial robbing of Terns by Shearwater . . . . .	16
CORBEN, Chris. On some field characters of the Red Goshawk . . . . .	17
REVIEW	
Hawks in Focus - A Study of Australia's Birds of Prey . . . . .	19

# THE QUEENSLAND ORNITHOLOGICAL SOCIETY

## OFFICERS AND COUNCIL FOR 1982

*President*  
P. WOODALL

*Country V. President*  
P. HUGHES

*Vice President*  
R. MAHONEY

*Country V. President*  
J. WALTER

*Past President*  
I. VENABLES

*Secretary*  
C. WINGATE

*Treasurer*  
P. ELMES

*Editor of The Sunbird*  
C. CORBEN

*Council*  
S. ELMES, S. MATHEWS, J. MOVERLEY, D. NILAND, T. NORRIS,  
A. PYLE, P. VEERMAN, M. WHITMORE

The objects of the Society are to promote the scientific study and conservation of birds by all means possible, with particular reference to the birds of Queensland.

Annual subscription rates to the Society are:

Ordinary member	\$ 8.00
Family member	\$10.00
Junior member	\$ 5.00
Sunbird subscription only	\$ 5.00

All members receive a monthly newsletter and a copy of the quarterly journal, *The Sunbird*. The price of *The Sunbird* to non-members is \$1.25 per issue. The Society holds a general meeting and a field excursion each month.

All correspondence, including membership fees, should be addressed to the Secretary. The Society's address is:

P.O. Box 97, St. Lucia, Queensland, 4067.

# THE SUNBIRD

Volume 12 Number 1

May, 1982

## BIRD WEIGHTS AND MEASUREMENTS FROM WELLINGTON POINT SOUTH-EAST QUEENSLAND

J.S. ROBERTSON and P.F. WOODALL

### SUMMARY

The weights and measurements (total length, wing-span and wing length) of 47 species of birds banded at Wellington Point are presented. Many of these weights are significantly larger than those from northern Australia, supporting Bergmann's Rule. Contradictions to this are found in the Varied Triller and Lewin's Honeyeater.

### INTRODUCTION

Bird weights are important in many aspects of ornithological research, for example, taxonomy (Amadon, 1943); ecology and physiology. However, birds weights are often difficult to obtain. Early museum specimens seldom give weights and even recent museum specimens can give spurious weights when they have been frozen for some time before skinning or have been allowed to dehydrate.

Data from banding operations can provide some of this information, particularly since large numbers of individuals can be weighed and measured. One disadvantage is that accurate sexing is often impossible but, nevertheless, these weights and measurements can provide a valuable 'average' for the species from one locality.

J.S. Robertson banded birds at Wellington Point, south of Brisbane (27° 28'S, 153° 14'E), from 1964 to 1973 and his records provide a wealth of information, some of which is summarized here. More detailed analyses of some individual species are being prepared (Robertson and Woodall, 1982).

### MATERIALS AND METHODS

Most birds at Wellington Point were caught at traps at sugar-water feeders (Robertson, 1964, 1966) but some were caught in mist-nets, or were road casualties up to 20 km from Wellington Point. Weights were taken to the nearest gram (using a "letter balance", Robertson, 1966) and measurements of wing length, total length and wing span were recorded to the nearest mm using the methods described by Disney (1974). These banding activities took place throughout the year, with no emphasis on any particular season.

Statistical analyses were performed using the methods described by Sokal and Rohlf (1969), Student's t-test being used to determine the significance of differences between mean values. Only species for which three or more individuals had been weighed or measured were included in this analysis. The nomenclature and sequence of species follows Schodde *et al.* (1978).

## RESULTS

The data on bird weights and measurements are summarized in Table 1. Comments on individual species are only provided where there is significant difference from, or agreement with, published records. No exhaustive literature search has been attempted and Hall (1974) has been used as the basis for most relevant references and comparisons.

The significance levels of the statistical tests should be treated with some caution since the samples were often small and the data may not be normally distributed. However the t-test is normally quite robust in these situations.

The collecting localities in Hall (1974) referred to below as 'North Queensland were: Moonlight Creek; Wernadinga; Glenore; Inkerman; Big Tableland; Ayton; Walter Hill Range; Tully; Glendower; Cape Gloucester and Mt Dryander. These were all between the latitudes 15° 40'S and 20° 45'S and did not include the Cape York Peninsula. For further details on these localities, refer to Hall (1974).

### Forest Kingfisher

The mean weight of Wellington Point birds (42.6 g) is considerably larger than the weights of two males from Darwin (36.7 g; 38.5 g) (Hall, 1974).

### Sacred Kingfisher

Weights from Wellington Point are not significantly different from those for Western Australia (Hall, 1974) supporting Keast's (1961) view that there is negligible geographical variation in Australia.

### Black-faced Cuckoo-shrike

Weights from Wellington Point birds are not significantly different from birds collected in Western Australia and the Northern Territory (Hall, 1974), but the mean wing length from Wellington Point (193 mm) is smaller than that cited by Keast (1958a) for the southern race *melanops* (over 200 mm). Hall (1974) suggests that there is a single race in the eastern, northern and southern wetter areas showing clinal variation in wing and bill size.

### Varied Triller

Weights from Wellington Point (mean=30.5 g) are significantly smaller ( $P < 0.05$ ) than birds from Darwin (mean=32.9 g) (Hall, 1974). This is surprising since the Darwin birds are referable to the race *L. l. rufiventer* which Keast (1958a) shows has a

slightly smaller wing length (99 mm) than the local race *L. l. leucomela* (101 mm).

#### Leaden Flycatcher

Weights from Wellington Point (mean=13.3 g) were significantly greater ( $P < 0.05$ ) than those from North Queensland (mean=11.9 g) (Hall, 1974) probably reflecting a south-north cline of decreasing size (Keast, 1958b).

#### Grey Fantail

Weights, wing length and total length of birds from Wellington Point all fall within the range of the local race, *R. f. alisteri*, given by Ford (1981b).

#### Willie Wagtail

Weights from Wellington Point (mean=20.0 g) were significantly larger ( $P < 0.05$ ) than those from North Queensland (mean=17.2 g) (Hall, 1974) reflecting the south-north decrease in size (Keast, 1958).

#### Variegated Wren

Weights from Wellington Point (mean=8.3 g) were significantly larger ( $P < 0.01$ ) than those from North Queensland (mean=7.7 g) (Hall, 1974) but Hall (1974) considers that there are no consistent local size differences.

#### Mangrove Gerygone

The mean weight of Wellington Point birds (mean=7.6 g) is significantly larger ( $P < 0.01$ ) than weights from North Queensland (mean=6.4 g) (Hall, 1974). This agrees with the eastern race *cantator* being larger than the northern race *levigaster* (Ford, 1981a).

#### White-throated Tree Creeper

Weights from Wellington Point (mean=18.5 g) were not significantly different from those in North Queensland (mean=17.7g) although Hall (1974) placed the latter in the smaller, darker race *C. l. minor*. Schodde *et al.* (1978) considers this to be a distinct species *C. minor*.

#### Lewin's Honeyeater

Weights from Wellington Point (mean=29.3 g) were significantly smaller ( $P < 0.001$ ) than those from North Queensland (mean=33.5 g) which Hall (1974) referred to *M. l. lewinii*. Wing-span measurements from Iluka on the north coast of New South Wales (mean=301 mm) (Smedley, 1977) were also significantly larger ( $P < 0.001$ ) than those from Wellington Point, 200 km north (mean=282 mm).

#### White-throated Honeyeater

Weights from Wellington Point (mean=13.4 g) are significantly

larger ( $P < 0.001$ ) than those from North Queensland (mean=10.6 g) (Hall, 1974). Hall (1974) considers that the North Queensland birds are *M.a. subalbogularis* or are intermediates between it and the local race *M.a. albogularis*.

#### Brown Honeyeater

Birds from Wellington Point are significantly heavier (mean=13.0 g) ( $P < 0.001$ ) than those from North Queensland (mean=10.4 g) (Hall, 1974) but Mees (1961) considers that there is only one race in Australia.

#### Spangled Drongo

Weights from Wellington Point (mean=90.4 g) are significantly greater ( $P < 0.001$ ) than those from Darwin (mean=71.3 g) (Hall, 1974).

#### Grey Butcherbird

Birds from Wellington Point are significantly heavier (mean=97.9 g) ( $P < 0.05$ ) than those from Glendower in Central Queensland (mean=86.5 g) (Hall, 1974).

Table 1. Weights and measurements of birds from Wellington Point, South-east Queensland. (Data presented as mean; range; standard error of mean; and sample size).

Species	Weight (g)	Length (mm)	Wing span (mm)	Wing length (mm)
Brown Quail <i>Coturnix australis</i>	83.0 (80-87) 2.1; 3	187 (186-188) 0.7; 3	290 (270-300) 10; 3	89 (80-93) 2.9; 4
Peaceful Dove <i>Geopelia placida</i>	50.6 (43-59) 1.4; 13	212 (196-225) 3.2; 11	303 (285-321) 3.4; 11	99 (95-102) 1.6; 5
Scaly-breasted Lorikeet <i>Trichoglossus chlorolepidotus</i>	77.5 (75-82) 1.7; 4	245 (240-250) 2.0; 4	364 (340-375) 8.0; 4	-
Common Koel <i>Eudynamis scolopacea</i>	197 (154-237) 24; 3	-	-	-
Laughing Kookaburra <i>Dacelo novaeguineae</i>	322 (315-332) 2.7; 6	436 (425-450) 3.4; 7	744 (720-765) 5.5; 7	-
Forest Kingfisher <i>Halcyon macleayi</i>	42.6 (35-48) 1.2; 9	208 (196-213) 2.0; 9	327 (310-340) 3.6; 9	91 (86-95) 0.9; 9

Table 1 (continued)

Species	Weight (g)	Length (mm)	Wing span (mm)	Wing length (mm)
Sacred Kingfisher <i>Halcyon sancta</i>	45.3 (37-55) 1.0; 19	211 (202-227) 1.6; 22	330 (290-345) 2.9; 21	91 (88-93) 0.6; 9
Welcome Swallow <i>Hirundo neoxena</i>	13.3 (13-14) 0.3; 4	152 (141-157) 3.7; 4	285 (278-295) 3.9; 4	-
Black-faced Cuckoo-shrike <i>Coracina novaehollandiae</i>	115 (94-148) 12.6; 4	323 (312-336) 6.2; 4	573 (565-585) 4.3; 4	193 (185-198) 2.8; 4
Varied Triller <i>Lalage leucomela</i>	30.5 (29-32) 0.7; 4	198 (190-203) 2.9; 4	292 (290-295) 1.7; 3	-
Rose Robin <i>Petroica rosea</i>	7.5 (7-8) 0.2; 6	127 (124-132) 1.1; 6	185 (180-195) 2.6; 5	-
Eastern Yellow Robin <i>Eopsaltria australis</i>	19.2 (16-24) 0.4; 33	158 (147-172) 1.2; 33	246 (205-262) 2.4; 26	83 (77-86) 1.5; 7
Golden Whistler <i>Pachycephala pectoralis</i>	22.8 (21-26) 0.3; 24	180 (172-188) 0.9; 24	270 (230-290) 3.2; 20	91 (86-95) 0.8; 9
Rufous Whistler <i>Pachycephala rufiventris</i>	22.8 (20-28) 0.5; 15	170 (158-181) 1.5; 15	271 (260-283) 1.9; 14	91 (87-94) 1.1; 5
Grey Shrike-thrush <i>Colluricincla harmonica</i>	66.3 (59-77) 2.4; 6	248 (240-253) 1.9; 6	376 (360-385) 5.5; 4	-
Leaden Flycatcher <i>Myiagra rubecula</i>	13.3 (12-15) 0.9; 3	159 (154-165) 3.3; 3	227 (223-232) 2.7; 3	-
Grey Fantail <i>Rhipidura fuliginosa</i>	7.8 (7-9) 0.2; 12	158 (154-162) 1.9; 12	205 (190-213) 2.9; 7	75 (71-78) 0.9; 6
Willie Wagtail <i>Rhipidura leucophrys</i>	20.0 (19-21) 0.6; 3	207 (198-212) 3.1; 4	283 (282-285) 0.9; 3	96 (94-100) 1.4; 4
Variegated Fairy-wren <i>Malurus lamberti</i>	8.3 (7-10) 0.2; 30	144 (132-158) 1.3; 25	146 (140-156) 1.4; 13	45 (42-48) 1.3; 4



Table 1 (continued)

Species	Weight (g)	Length (mm)	Wing span (mm)	Wing length (mm)
Red-backed Fairy-wren <i>Malurus melanocephalus</i>	8.0 (7-9) 0.6; 3	130 (128-131) 0.9; 3	-	-
Speckled Warbler <i>Sericornis sagittatus</i>	13.3 (12-16) 0.2; 27	131 (120-141) 0.9; 27	193 (182-205) 1.2; 26	62 (61-62) 0.3; 4
Mangrove Gerygone <i>Gerygone laevigaster</i>	7.6 (7-9) 0.4; 5	112 (95-116) 3.5; 6	175 (172-180) 2.0; 4	-
Brown Thornbill <i>Acanthiza pusilla</i>	6.9 (6-8) 0.2; 13	106 (101-111) 1.0; 12	148 (135-153) 2.1; 10	46 (45-47) 0.5; 4
White-throated Treecreeper <i>Climacteris leucophaea</i>	18.5 (18-20) 0.5; 4	155 (148-161) 2.9; 4	245 (240-255) 3.2; 4	81 (81-82) 0.3; 3
Noisy Friarbird <i>Philemon corniculatus</i>	100 (75-130) 0.9; 156	331 (270-358) 1.1; 156	459 (415-500) 2.4; 66	148 (129-162) 0.5; 139
Little Friarbird <i>Philemon citreogularis</i>	61.6 (47-76) 0.6; 102	271 (252-290) 0.9; 102	392 (355-415) 1.8; 56	127 (116-137) 0.6; 80
Blue-faced Honeyeater <i>Entomyzon cyanotis</i>	-	115 (103-123) 4.7; 3	293 (285-300) 4.4; 4	-
Noisy Miner <i>Manorina melanocephala</i>	65.9 (58-75) 1.7; 11	249 (235-265) 3.5; 11	-	-
Lewin's Honeyeater <i>Meliphaga lewinii</i>	29.3 (25-35) 0.8; 14	216 (206-230) 2.0; 14	282 (260-296) 4.7; 8	92 (85-98) 1.5; 7
Yellow-faced Honeyeater <i>Lichenostomus chrysops</i>	16.3 (13-20) 0.2; 79	168 (153-185) 0.7; 83	235 (217-255) 1.6; 41	76 (72-80) 1.1; 8
Mangrove Honeyeater <i>Lichenostomus fasciocularis</i>	28.6 (22-35) 0.2; 285	202 (182-222) 0.5; 290	277 (251-300) 1.3; 97	90 (79-99) 0.3; 158
Fuscous Honeyeater <i>Lichenostomus fuscus</i>	15.8 (15-19) 1.8; 5	157 (148-166) 3.5; 5	-	77 (74-81) 2.0; 3

Table 1 (continued)

Species	Weight (g)	Length (mm)	Wing span (mm)	Wing length (mm)
White-throated Honeyeater <i>Melithreptus albogularis</i>	13.4 (12-16) 0.2; 61	142 (126-152) 0.9; 62	222 (205-235) 1.7; 27	72 (67-78) 0.8; 17
Brown Honeyeater <i>Lichmera indistincta</i>	13.0 (10-17) 0.2; 69	149 (128-163) 0.9; 78	204 (170-225) 1.9; 47	-
Eastern Spinebill <i>Acanthorhynchus tenuirostris</i>	10.2 (8-14) 0.2; 37	154 (140-173) 1.4; 35	188 (160-203) 4.2; 10	64 (60-71) 0.8; 18
Scarlet Honeyeater <i>Myzomela sanguinolenta</i>	7.6 (7-9) 0.1; 28	111 (101-117) 0.7; 28	174 (150-187) 2.0; 20	56 (54-60) 2.0; 3
Mistletoebird <i>Dicaeum hirundinaceum</i>	8.0 (7-9) 0.4; 4	103 (100-107) 1.5; 4	182 (175-185) 2.4; 4	-
Striated Pardalote <i>Pardalotus striatus</i>	11.1 (10-14) 0.6; 6	108 (95-119) 2.8; 6	181 (168-195) 2.8; 7	59 (51-62) 2.7; 4
Silvereye <i>Zosterops lateralis</i>	-	120 (116-128) 2.6; 40	182 (172-190) 0.6; 39	-
Red-browed Firetail <i>Emblema temporalis</i>	9.2 (9-10) 0.1; 18	118 (112-122) 2.1; 21	160 (150-169) 1.2; 16	50 (47-54) 0.9; 7
Double-barred Finch <i>Poephila bichenovii</i>	9.3 (8-11) 0.1; 33	110 (102-118) 0.5; 38	157 (155-160) 1.0; 5	50 (50-52) 0.4; 5
Chestnut-breasted Mannikin <i>Lonchura castaneothorax</i>	13.3 (12-15) 0.6; 4	119 (114-124) 2.1; 4	-	-
Olive-backed Oriole <i>Oriolus sagittatus</i>	101 (97-108) 3.4; 3	-	-	148 (141-152) 3.4; 3
Spangled Drongo <i>Dicrurus hottentottus</i>	90.4 (83-107) 0.9; 59	311 (297-327) 1.1; 59	489 (450-510) 3.7; 18	159 (148-169) 0.8; 53
Dusky Woodswallow <i>Artamus cyanopterus</i>	35.0 (29-41) 1.4; 7	183 (174-190) 2.1; 7	348 (340-355) 1.8; 7	124 (122-126) 0.7; 5

Table 1 (continued)

Species	Weight (g)	Length (mm)	Wing span (mm)	Wing length (mm)
Grey Butcherbird <i>Cracticus torquatus</i>	97.9 (85-115) 3.6; 7	296 (285-310) 3.6; 8	452 (435-460) 3.3; 7	147 (140-152) 2.5; 5
Pied Currawong <i>Strepera graculina</i>	275 (222-317) 7.3; 16	459 (440-482) 3.1; 16	734 (705-780) 5.1; 15	246 (225-260) 3.1; 11

## DISCUSSION

Weight is generally regarded as a more variable parameter than linear measurements. The mean co-efficient of variation (CV) for species weights in this study was considerably higher (9.2%: range = 2-22) than that for wing length (3.8%:range = 0.7-9.1), wing-span (3.5%:range = 0.5-6.9) or total length (3.4%:range = 0.6-7.9). No doubt this reflects, in part, seasonal changes in body weight. But Amadon (1943) states that the high variability of weights is partly due to the cumulative variation in the linear dimensions of the object and taking the cube root of weight reduces variation to a value comparable to that of linear measurements. The Black-faced Cuckoo-Shrike had a particularly high CV of weight (21.9%) while its CV's for the other measurements were normal. This is worthy of further investigation, particularly since the species is migratory (Keast, 1958a).

Weights of most species from Wellington Point were larger than those from North Queensland (Hall, 1974). This would satisfy Bergmann's Rule (Thomson, 1964) which states that "in a polytypic species, body size tends to be larger in cooler parts of the total range and smaller in the warmer parts". The only species contradicting this were the Varied Triller (on a small number of weights) and, more significantly, Lewin's Honeyeater.

## REFERENCES

- Amadon, D. 1943. Bird weights as an aid in taxonomy. *Wilson Bull.* 55: 164-177.
- Disney, H.J. de S. 1974. *Bird in the hand*. Sydney: Bird Banders Association of Australia.
- Ford, J. 1981a. Morphological and behavioural evolution in populations of the *Gerygone fusca* complex. *Emu* 81: 57-81.
- Ford, J. 1981b. Evolution, distribution and stage of speciation in the *Rhipidura fuliginosa* complex in Australia. *Emu* 81: 128-144.
- Hall, B.P. (Ed.) 1974. *Birds of the Harold Hall Australian expeditions, 1962-70*. London: Trustees of the British Museum (Natural History).
- Keast, A. 1958a. Variation and speciation in the Australian Campephagidae (Passeres). *Aust. J. Zool.* 6: 248-267.
- Keast, A. 1958b. Variation and speciation in the Australian flycatchers (Aves. Muscicapinae). *Rec. Aust. Mus.* 24: 73-108.

- Keast, A. 1961. Bird speciation on the Australian Continent. *Bull. Mus. comp. Zool. Harv.* 123: 305-495.
- Mees, G.F. 1961. An annotated catalogue of bird-skins from West Pilbara, Western Australia. *Proc. R. Soc. West. Aust.* 44: 97-143.
- Robertson, J.S. 1964. Feeding honeyeaters. *Aust. Bird Bander* 2: 107-109.
- Robertson, J.S. 1966. Honeyeater size variation. *Aust. Bird Bander* 4: 50-52.
- Robertson, J.S. and Woodall, P.F. 1982. Measurements, weights and seasonal variations of the Mangrove Honeyeater *Lichenostomus fasciocularis* in South-east Queensland (*In press*) *Corella*:
- Schodde, R., Glover, B., Kinsky, F.C., Marchant, S., McGill, A.R. and Parker, S.A. 1978. Recommended English names for Australian birds. *Emu* 77, Suppl.
- Smedley, D.I. 1977. Sexing of Lewin's Honeyeaters. *Corella* 1: 34-35.
- Sokal, R.R. and Rohlf, F.J. 1969. *Biometry: the principles and practice of statistics in biological research*. San Francisco: Freeman.

J.S. ROBERTSON, Hopetoun, 280 Cliveden Road, Corinda, Brisbane.

P.F. WOODALL, Dept. of Veterinary Anatomy, University of Queensland, St. Lucia, Queensland, 4067.

\*\*\*\*\*

## THE NEST AND EGGS OF THE MOUNTAIN THORNBILL

*ACANTHIZA KATHERINA*

JOHN L. MCKEAN and HANS BESTE

On 7 October 1981, on Mt Lewis, Julatten, Queensland, at an altitude of 1050 metres, we located a pair of Mountain Thornbills *Acanthiza katherina* carrying material to a virtually fully completed nest in a small sapling growing on a road bank. The nest contents were not inspected until 14 October 1981, and the nest was found to contain two eggs which were described and measured. The height of the base of the nest off the ground was also measured and found to be 65 cm. The eggs were tapered oval in shape, pinkish, quite lustrous and sparsely and finely spotted brown throughout. A ring of brown spotting and dull grey-brown suffused markings about 0.5 mm thick on one egg and 1 mm on the other encircled the larger ends. The eggs measured 17.8 x 12.7 mm and 16.9 x 12.2 mm.

No formal description of the eggs of this species appears to have previously been published, however Beruldsen (1980) states that the clutch is two or three and that the eggs are indistinguishable in colour, size and shape from those of *Acanthiza nana*. While the eggs we found did not agree closely with the few clutches of Little Thornbill eggs that we have recently examined, comparison of a large series of eggs may well show Beruldsen to be correct.

Other nests found include one on 6 November 1972 in Forest Reserve 194 (Atherton - Mt Baldy, Queensland). This nest contained one chick and was situated at 2.6 m in a *Neditsea*

*dealbata* tree. (Identification by B. Hyland, Forestry Department). The nest was photographed and filmed with adults feeding the young. Photographs were published in Wade (1975) and Frith (1976) and part of the filmed sequence appeared in the film "Australia's Untamed Wilderness".

A second nest containing one chick was discovered in the same area on 14 November 1972. The nest was about 1 m above the ground in an unidentified tree. Both nests were collected after the chicks had flown and one lodged with the Queensland Museum and the other with the National Museum of Victoria.

Table 1.

Nest dimensions in cm	6.11.1972	14.11.1972	14.10.1981
Length (vertical)	20	12.5	14.5
Depth (horizontal)	12.5	7.5	8
Width (across entrance)	12.5	8	8.5
Diameter entrance hole	4	4	3.5

The nests were constructed and composed much as described in Beruldsen (*loc. cit.*) except that in all cases feathers occurred in the inside lining. In August 1979, 5 nests were found on Mt Lewis at heights up to 6 metres and another nest 4.2 m above ground was located on Mt Lewis on 10 November 1980. None of these nests was examined to ascertain contents. The nests of Mountain Thornbills appear to differ consistently from those of the Brown Thornbill *A. pusilla* by their bulkiness and markedly larger size. This, then, is another character additional to those given by McKean and Hitchcock (1969) by which these two species differ.

#### REFERENCES

- Beruldsen, Gordon R. 1980. *A Field Guide to Australian Birds' Nests and Eggs*. Rigby: Adelaide 448 pp.  
 Frith, H.J. (Ed.) 1976. *Reader's Digest Complete Book of Australian Birds*. Reader's Digest Services: Sydney.  
 McKean, John L. and Hitchcock, W.B. 1969. The taxonomic status of *Acanthiza katherina* De Vis. *Emu* 69: 113.  
 Wade, Peter 1975. *Every Australian Bird Illustrated*. Rigby: Adelaide.

#### FILM REFERENCE

- Australia's Untamed Wilderness* - Hans and Judy Beste Productions. Melbourne 1974.

JOHN L. MCKEAN, Wildlife Research Section, Conservation Commission of the Northern Territory, P.O. Box 38496, Winnellie, N.T. 5789.  
 HANS BESTE, 'Ptiloris', Julatten, C/- Post Office, Mt Molloy, Queensland, 4880.

## WHITE-BELLIED SEA-EAGLE FEEDING ON FRESHWATER TURTLES

P.F. WOODALL

The White-bellied Sea-Eagle *Haliaeetus leucogaster* takes a wide variety of prey including crustacea, sea-snakes and other reptiles, birds and mammals; and these animals are taken both alive and as carrion (Cayley, 1971; Calaby, 1976; Frith, 1976). It has been recorded killing adult freshwater turtles (tortoises) by Worrell (1966) but no details of the species or size of turtles involved were given.

During a QOS outing to Atkinson's Dam, Lowood (27° 26'S, 152° 27'E) on 11 June 1978 a White-bellied Sea-eagle's nest was found in a tall *Eucalyptus* tree, 200 m from the water's edge. At the base of the nest numerous freshwater turtle shells were found. A small collection of shells was made on this occasion and on subsequent visits in March and May 1979 many fresh shells were collected. These were later measured and have now been deposited in the Queensland Museum.

Later visits indicated that the nest had been abandoned, probably through human interference since on one occasion a loop of nylon fishing line was found up to the nest, and no further turtle shells were found. Two marked shells, containing much flesh, remained in position under the nest for over 10 months indicating that there was little or no removal of the shells by other predators.

A total of 26 shells, representing three species, was collected (Table 1). The estimated weight of a freshwater turtle (*Emydura* sp.) with a carapace length of 186 mm would be about 700 g (A. Gorges, *pers. comm.*). In all but two cases the shells were devoid of any flesh. The two exceptions were both found in May 1979 and one of these had a large puncture in the carapace, possibly the result of being dropped by the eagle.

The turtle shells found in June 1978 were at a time of botulism outbreaks on Atkinson's Dam and nearby waterbodies (Woodall, 1979) and therefore these turtles might have been obtained by the eagles as carrion. However the fresh turtle shells found in March and May 1979 were at a time of high water levels, with no botulism observed, and were most likely caught alive.

At Broadwater Lagoon, Dalby (27° 21'S, 151° 06'E) in May 1980 a single turtle shell was found beneath a White-bellied Sea-eagle's nest, suggesting that the capture of freshwater turtles may be more widespread among these eagles, particularly those living inland, than has been previously reported.

I am grateful to Jeanette Covacevich and Greg Czechura, Queensland Museum, for identifying the turtle shells.

Table 1. Freshwater turtle shells found beneath the nest of a White-bellied sea-eagle.

Species	Carapace Length (mm)			Number
	Mean	Standard Error	Range	
<i>Chelodina</i> (? <i>longicollis</i> ) Long-necked Turtle*	160	-	-	1
<i>Elseya</i> (? <i>latisternum</i> ) Saw-shelled Turtle	78	-	-	1
<i>Emydura</i> (? <i>macquarrii</i> ) Murray Turtle	186	7.2	88-234	24

\* Nomenclature follows Cogger (1979).

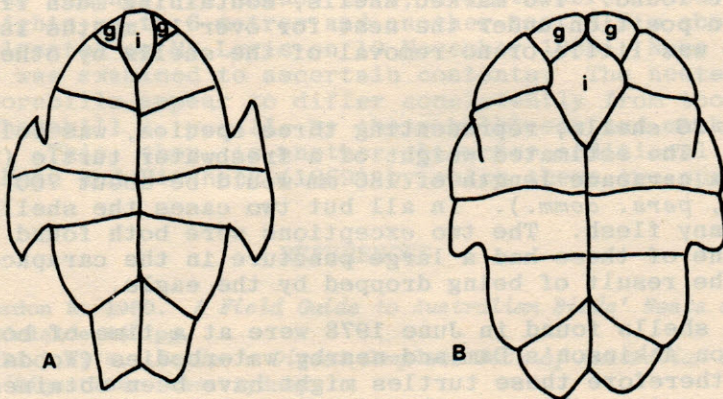


Figure 1. Diagrams of the plastron (under-shell) of Australian Freshwater Turtles.

- A. The Short-necked Turtles (including *Emydura* and *Elseya*) have the interregular shield (i) reaching the margin of the plastron between the two gular shields (g).
- B. The Long-necked Turtles (including *Chelodina*) have the interregular shield (i) behind the gular shields (g).

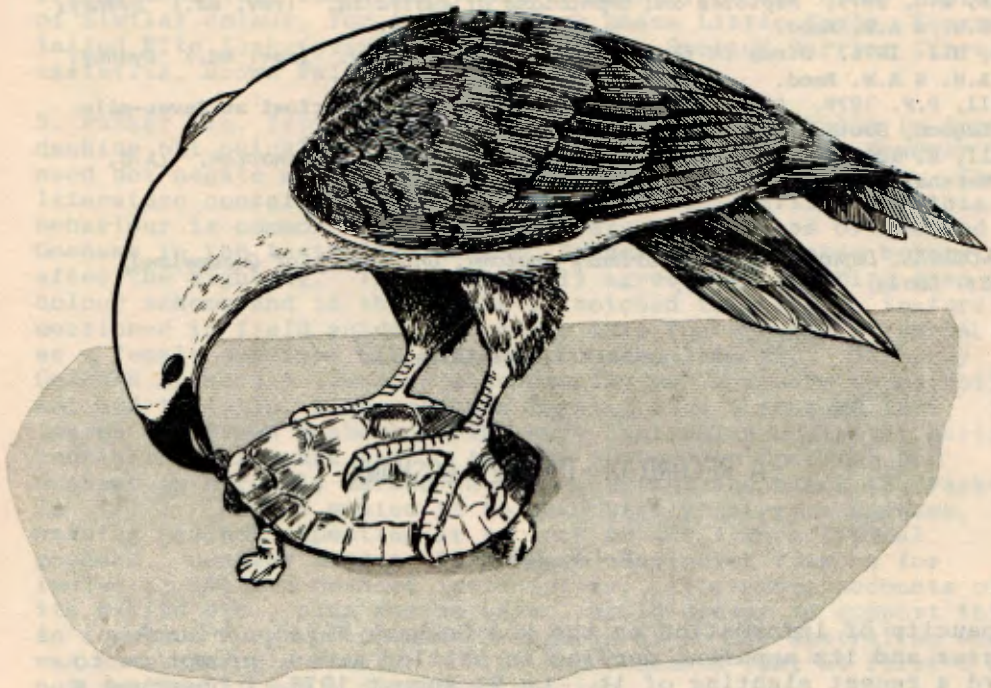


Figure 2. White-bellied Sea-Eagle feeding on a Freshwater Turtle.  
(Drawing by Doug Bailey, Department of Veterinary Anatomy).



## REFERENCES

- Calaby, J. 1976. White-breasted sea eagle. In *Complete Book of Australian Birds* (H.J. Frith consul. ed.) p. 128. Sydney: Reader's Digest.
- Cayley, N.W. 1971. *What bird is that?* (5th. rev. ed.) Sydney: Angus & Robertson.
- Cogger, H.G. 1979. *Reptiles and amphibians of Australia.* (rev. ed.) Sydney: A.H. & A.W. Reed.
- Frith, H.J. 1976. *Birds in the Australian High Country.* (rev. ed.) Sydney: A.H. & A.W. Reed.
- Woodall, P.F. 1979. Suspected botulism poisoning of waterfowl at Seven-mile Lagoon, South-east Queensland. *Sunbird* 10: 17-20.
- Worrell, E. 1966. The unpopular ones. In *The great extermination.* (A.J. Marshall, ed.) pp. 75-94. London: Heineman.

P.F. WOODALL, Department of Veterinary Anatomy, University of Queensland, St. Lucia. Qld. 4067.

\*\*\*\*\*

## A RECORD OF THE RED GOSHAWK

S.J.S. DEBUS

The paucity of information on the Red Goshawk *Erythrotriorchis radiatus* and its apparent decline in settled areas, prompt me to record a recent sighting of it. On 21 August 1978, I observed a large reddish hawk near Clermont, Queensland. The habitat consisted of open eucalypt forest with patches of cleared land nearby. The hawk was viewed through 8x40 binoculars at about 200 metres. During mid-morning (about 10.00 hrs) on a clear, sunny day, it was flying directly over the tree canopy at about 20 metres, alternately flapping and gliding. The wing beats were rapid (about two per second), deep and powerful, slightly slower than those of a Brown Goshawk *Accipiter fasciatus*; about nine beats made up a sequence. It maintained a rising course with ease, and gave the impression of being a swift and powerful bird. It then began soaring in tight spirals to about 100 metres, with occasional bouts of flapping (about five beats to a series), and gradually drifted northwards. It did not appear to be hunting.

In size the bird approached the Little Eagle *Hieraaetus morphnoides*. In build it was more robust than the Brown Goshawk, with larger and more "fingered" wings and a broader tail with a square tip. The tail appeared shorter in proportion than that of a Brown Goshawk, and was about the length of the wing's width at its base. In gliding flight the wings were held level, but when soaring there was a slight but definite dihedral (like the Brown Goshawk and the Collared Sparrowhawk *A. cirrhocephalus*). Its shape and flight resembled those of other accipiters, but in end-on view it had a surprisingly wide wing-spread (for an accipiter). In side-on view it resembled a large Sparrowhawk. The body had a general

reddish tone, and the flight and tail feathers were grey-brown with darker bars on the upper side and whitish with faint bars on the under side. Other details of plumage etc. were not discernible because of the distance and glare. However by a process of elimination it can only have been a Red Goshawk. Its shape and flight behaviour immediately set it apart from all other raptors of similar colour, for instance dark phase Little Eagle, Square-tailed Kite *Lophoictinia isura*, immature Spotted Harrier *Circus assimilis*, Brown Falcon *Falco berigora*.

S. Parker (*in litt*) stated that the Red Goshawk skulks in trees, dashing out quickly after prey, rather than soaring. However this need not negate my identification of the bird in question. The literature contains accounts of this species soaring, and this behaviour is common in other accipiters. Specimens of the Red Goshawk in the Australian Museum, Sydney, were checked before and after the sighting. These generally agree with the bird seen in colour scheme and in the square to notched tail tip, a feature not mentioned in field guides. However this feature may be variable as a female specimen had a rather rounded tail tip. The Grey Goshawk *A. novaehollandiae* also usually has a square to slightly notched tail tip, although some females have a rounded tail; this leaves the Brown Goshawk as the only Australian accipiter having a consistently rounded tail. Another feature is that the Red Goshawk is strongly marked in rich chestnut and black (S. Parker *in litt.*). Parker stated it to be a highly aberrant goshawk, warning against expecting it to look or act like a typical goshawk. However Amadon (1978) gave convincing reasons for including the Red Goshawk in *Accipiter*; literature accounts of its habits etc., plus museum skins, would appear to support this. An immature Burgers' Goshawk *A. buergeri* in the Australian Museum was so strikingly similar to the Red Goshawks that at first I did not realise it was a different species.

F. Morris (*in litt.*) remarked that in Queensland, Red Goshawk sightings were formerly more frequent - he has not seen one in the Cairns region since 1978 despite residence there. The supposed rarity and decline of this species require that its status be investigated, and its population trends and breeding success be monitored. All sightings should be reported, preferably with as many details on its habits and biology as possible. However the precise location of nests or even suspected resident pairs should not be publicised because of the use of such information to egg collectors. The Red Goshawk may require conservation action, and this action will depend on knowledge of its life history and ecological requirements.

#### ACKNOWLEDGEMENTS

I wish to thank Shane Parker and Frank Morris for information on the Red Goshawk. Staff at the Australian Museum allowed free access to raptor specimens. I also wish to thank Chris Corben for some helpful comments on the manuscript.

#### REFERENCE

Amadon, D. 1978. Remarks on the taxonomy of some Australasian raptors. *Emu* 78: 115-118.

STEPHEN J.S. DEBUS, 42 Kenneth Street, Longueville, N.S.W. 2066.

## AERIAL ROBBING OF TERNS BY SHEARWATER

CHRIS CORBEN

Skuas (*Stercorariidae*) and Frigatebirds (*Fregatidae*) are famous for robbing other seabirds. Typically, they chase the victim in aerial pursuit until the latter releases its food which is recovered by the robber, usually from the water. However, I have found no reference to such aerial robbing behaviour being attributed to petrels.

On 1 February 1981, Keven Bartram, Doug Robinson, Anita Smyth and I were watching seabirds from Pt Lookout (153° 33'E, 27° 26'S) Stradbroke Island, S.E. Qld. Several hundred Wedge-tailed Shearwaters *Puffinus pacificus* were seen and while most were moving southwards, several remained in the vicinity of Pt Lookout, feeding. About mid afternoon, we saw a Shearwater glide up to a height of about 6 m above the water, where it immediately began chasing a Crested Tern *Sterna bergii*. The Shearwater followed the Tern's manoeuvres for about 10 seconds, then glided down to land on the water where it was seen to peck at the surface. The whole performance was extremely similar to that of a Jaeger chasing a tern, differing mainly in that the Shearwater appeared to be less agile than a Jaeger and did not follow the Tern's manoeuvring so closely.

Over the next two hours, a Shearwater was seen chasing Crested Terns about 10 times. About half of these pursuits were followed by the Shearwater landing on and feeding from the surface, suggesting that the terns had been successfully robbed. On other occasions, the Shearwater resumed its normal mode of flight after the chase.

We suspected that the same Shearwater was involved in all the chases, as the bird appeared somewhat paler in plumage than the surrounding Wedge-tails, although direct comparisons were not obtained. Unfortunately, there was disagreement amongst us as to the identity of the petrel concerned. The general shape, obvious white legs and bill looking pale with a darker tip all point conclusively to it having been either a Wedge-tailed Shearwater or a Flesh-footed Shearwater *Puffinus carneipes*. The bill looked more conspicuously pale than is usual for a Wedge-tail and the wings sometimes seemed to be held too straight, especially as the bird glided down to the water after a pursuit. On the other hand, Flesh-foots typically look blacker in overall plumage than Wedge-tails, not paler. Tail length could not be conclusively determined. Accordingly, the bird's specific identity remains in doubt.

CHRIS CORBEN, 24 Drury Street, West End. Qld.

\*\*\*\*\*

## ON SOME FIELD CHARACTERS OF THE RED GOSHAWK

CHRIS CORBEN

Because the Red Goshawk is so little known, any published photograph of the species in flight has a special significance to those interested in its field characters. Accordingly, many of us had regarded the photograph on page 127 of the Reader's Digest Complete Book of Australian Birds as being particularly helpful. However, while discussing Red Goshawks, John Izzard and I remarked upon a strong resemblance between the bird in that photo and an immature Marsh Harrier; a resemblance neither of us had noted in live Red Goshawks.

Subsequently, I examined skins and photographs in the Queensland Museum, revealing several ways by which the subject of the Reader's Digest photo differs from a Red Goshawk.

*Shape:* The bird in the photo has a general shape very much like that of a Marsh Harrier, with long, straight wings bearing short fingers and a tail which looks short in relation to wingspan. The tail appears notched, which is not typical of a Marsh Harrier, but this could be due to moult or missing feathers. While the wingshape is not unlike that of a Brown Goshawk, the fingers do not appear prominent enough for a Red Goshawk and the tail appears too short.

*Plumage:* In the photograph, the secondaries are clearly dark, like the lining, and contrast with the whitish inner primaries and bases of the outer primaries. This underwing pattern is identical to that of an immature Marsh Harrier, and by itself demonstrates that the photo is not of a Red Goshawk. The underwing of a Red Goshawk has a rufous lining and all the remiges appear silvery-white with numerous, narrow, black bars. This most closely resembles the underwing of a Square-tailed Kite or a Spotted Harrier. The undertail of a Red Goshawk is also silvery-white with bars, but the tail pattern of the Reader's Digest bird is not visible.

*Wing Formula:* Wing formulae were noted for all the Australian raptors with fingered wings. All these species had several of the outer primaries strongly emarginated to form the fingers and in most species, the distinctness of the fingers was accentuated by a marked jump in length from the innermost finger to the outermost of the remaining (inner) primaries. Wing formula was found to be consistent within a species but varied between species.

The Reader's Digest photo depicts a hawk with five fingers although the outermost (primary 10) does not appear separated from the leading edge. Primaries seven and eight are the longest and of roughly equal length, with primary six shorter than these and similar in length to primary nine. Among Australian raptors, this wing formula is found only in the two Harriers. The nearest to it is found in the Brown Goshawk and Collared Sparrowhawk which also have five fingers, but in those species, the ninth primary is

shorter in relation to primaries six and eight, and the sixth primary is closer in length to primary seven.

The Red Goshawk differs from the Harriers and Australian species of *Accipiter* in having six fingers, the longest being primary seven with primaries six and eight almost as long as primary seven, and primaries five and nine of approximately equal length. Essentially the same wing formula is also found in Black Kite, Square-tailed Kite, Black-breasted Buzzard, Brahminy Kite, Whistling Kite and Little Eagle. Interestingly, this same wing formula is also found in Burger's Goshawk *Accipiter buergeri* from Papua New-Guinea, which has been likened to the Red Goshawk (see S.J.S. Debus, this issue).

From the foregoing it should be clear that the bird depicted in the Reader's Digest is not a Red Goshawk. The only Australian species which it could be referable to is the Marsh Harrier, as the Spotted Harrier has a longer tail and lacks the dark secondaries in all plumages.

With their prominently fingered wings, Red Goshawks can appear rather kite-like. While gliding, the wings may be held bowed, as in a Whistling Kite, or at the other extreme, in a dihedral recalling Brown Falcon. This variation is also seen in Brown Goshawks.

I am thankful to Graeme Chapman and John Izzard for information relevant to this note, and to Staff at the Queensland Museum for access to their material.

CHRIS CORBEN, 24 Drury Street, West End, Queensland, 4101.

\*\*\*\*\*

## REVIEW

HAWKS IN FOCUS - A Study of Australia's Birds of Prey.  
Jack Cupper and Lindsay Cupper, Jacklin Enterprises, Mildura 1981.  
29.5 cm x 2.15 cm, 208 pages, 315 photographs.

It is said that you can't judge a book by its cover. On first seeing the front cover, I was impressed by the bold presentation and the superb photograph of a Spotted Harrier; the back features the incredible tower and hide that played such a vital role in this project: an exceptionally well inspired cover. It was soon apparent that this delightful book lived up to the promise of the cover.

The presentation is clear and the many colour photographs, which depict all Australian hawks, vary from good to superb (mostly the latter, though two are mediocre). Many photographs provide a unique view of the development of the chicks. The general appeal of the book is enhanced by occasional photographs and text dealing with features of the environment in which the birds occurred or apparatus used. The authors make no pretensions to producing an ornithological text book. However, this is a significant contribution to the field.

I was surprised by their statement that "as we are active fruit growers, the time we could spend away from our properties was often very limited." Even so, they apparently covered long distances at very short notice.

The format is the same for each of the twenty-four species: an account of the experiences had and observations made while photographing and filming the hawks at their nests, accompanied by their fine results. This is followed by a brief summary of basic biology and a distribution map. This makes a chatty and accessible book full of interesting sidelines. The total originality of the book creates fresh observations, particularly advantageous for the rare species, where most knowledge has previously seemed to be based on recycling old material. Two of the interesting sidelines are indeed very significant occurrences and these each rate a chapter to themselves, of course, with full photographic documentation. They were "Black breasted Buzzards rearing and preying on Kestrels" and "Interbreeding of Grey and Brown Goshawks".

There are other specific good points worth mentioning. It is commendable that they chose to follow the R.A.O.U. recommended vernaculars, (but with one exception - "Australian Little Eagle", apparently an oversight). Each scientific name is translated to English, a commendable practice I wish more natural history books would follow. There is a brief, useful description of the equipment used, and useful appendices (not labelled as such) at the back. Although most photographs are taken at the nest, for nearly all species at least one depicts the bird as we usually see it - flying overhead. Thus we clearly see the difference between the flying outline of a Black Falcon, Peregrine Falcon and Australian Hobby (sadly, not the Grey Falcon).

Of the few negative points, almost all could have been easily avoided. The book's only major flaw is the sequence of species - it is confused. As I am used to finding species in a book by taxonomic position, it is a bother to have to use the contents table. In particular the Baza is separated from the other kites, the Whistling Kite is separated from its congener, the Brahminy Kite and the Falconidae appear with the Accipitridae. Other criticisms are minor. The occasional reference to "wing and tail primaries" is incorrect. The comment about "a friendly discussion about birds of prey and birds in general (avian species, not *Homo sapiens*)" is well worn and in poor taste.

I would have preferred somewhat more rigorous, less anecdotal text with greater detail about general biology, apart from just observations at the nest. For most people, observations of hawks are brief, made only as the bird flies over and disappears. The emphasis here is very different from how most people perceive raptors. The book however is a very acceptable compromise between the need to appeal to a broad readership, and still be useful to raptor enthusiasts.

The book was wholly designed, set up and printed in Mildura and the result is a credit to the publishers. The material is a credit to the enormous effort undertaken by the authors. It is a significant contribution to "Australiana" literature as well as ornithological literature. The cost, for a book full of colour photographs, is quite reasonable. I fully recommend the final result as a delightful acquisition to all.

PHILIP VEERMAN

\*\*\*\*\*

## INSTRUCTIONS TO AUTHORS

The *Sunbird* is published quarterly by the Queensland Ornithological Society to further the knowledge of birds in Queensland and adjacent northern regions of Australia.

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

Manuscripts should be typed (if possible), double-spaced and two copies sent. Papers longer than 4 typed A4 pages should have a summary. If needed, help may be given to authors to find relevant literature. Common names, scientific names and order of names should follow "Recommended English Names for Australian Birds", in *The Emu* Volume 77, Supplement, 1978. Intending authors should consult recent issues of *The Sunbird* to see acceptable forms of contributions.

References should be listed in alphabetical order at the end of papers in the following style, titles of journals will be abbreviated as in the *World List of Scientific Periodicals*:

- Fleay, D.H. 1937. Nesting habits of the brush turkey. *Emu* 36:153-163.  
Frith, H.J. 1976. Mallee fowl. In *Complete Book of Australian Birds* (H.J. Frith consul. ed.) pp. 136-137. Sydney: Reader's Digest.  
Serventy, D., Serventy, V.N. & Warham, J. 1971. *The Handbook of Australian Sea-birds*. Sydney: Reed.  
Slater, P. 1970. *A Field Guide to Australian Birds. Non-Passerines*. Adelaide: Rigby.

Tables and Figures should be numbered with Arabic numerals. Drawings and diagrams should be in Indian ink on cartridge paper or tracing cloth. If authors cannot arrange suitable drawings, the editor may arrange the drawing of figures and diagrams.

Manuscripts should be sent to the Editor, *The Sunbird*, Queensland Ornithological Society, P.O. Box 97, St. Lucia, Qld. 4067.