

## SEX AND AGE CHARACTERS OF THE RUFIOUS SONGLARK

D. I. SMEDLEY<sup>1</sup> and W. E. BOLES<sup>2</sup>

<sup>1</sup>25B Railway Street, Baulkham Hills, NSW 2153

<sup>2</sup>The Australian Museum, 6-8 College Street, Sydney, NSW 2000

Received 15 July, 1987

Most recent texts make reference to the difference between the sexes of the Rufous Songlark *Cinchorhamphus mathewsi*, mostly on the basis of body length as a field characteristic. While the size difference can be a useful field mark, as can be the distinctive display flight of the male in breeding season (McGill 1970), there are features of plumage and soft part colours that allow easier and more precise separation of this species into sex and age classes. Some have previously been suggested by Rogers *et al.* (1986).

### METHODS

Information was gathered on these characters from two independent sources: live birds caught during the course of banding activities\* and museum study skins examined by Boles. Measurements and plumage notes were taken by Smedley from individuals mist-netted in the central-west of New South Wales during the period 1982-86. The study sites were Cookamidgera and Back Yamma State Forests near Parkes, Burrendong Arboretum near Wellington, and Munghorn Gap Nature Reserve near Mudgee. The preliminary sequence of plumages and moults was worked out with the assistance of students in the Ornithological Techniques class at the Sydney Technical College in late 1985 based on specimens in the collection of The Australian Museum. Subsequently specimens in the Museum of Victoria and the South Australian Museum have been examined by Boles. Measurements were taken as described by Disney (1974).

\*Bands used were supplied by the Australian Bird-Banding Scheme, Division of Wildlife and Rangeiands Research, CSIRO and the Australian Bird and Bat Banding Scheme, Australian National Parks and Wildlife.

### SEXING

The sexes of post-juvenile birds can be separated by measurements routinely taken in the course of banding operations or during processing of carcasses at the museum prior to preparation (see also Rogers *et al.* 1986). The measurements found useful have been wing length, tail length, wing span and weight; the sample size of head-bill measurements (total head length) (Rooke 1976) is too small to indicate if this technique is of value as a sexing criterion, although the available data suggest that males may be larger in this respect.

Within the wingspan measurements of live-trapped birds there were two distinct ranges: 241-266 mm (n=27) and 288-318 mm (n=15). Birds sexed as females by cloacal examination (see Disney 1967) had wingspan measurements within the smaller range, putative males in the larger. Museum specimens sexed by examination of the gonads confirmed this separation (Table 1).

Using individual birds' wingspans as the criterion for sexing of the live birds, their wing and tail measurements and weight were separated into two categories that were nearly or entirely exclusive (Table 1). Female weights (20-28.5 g)

TABLE 1

Measurements of Rufous Songlarks based on live caught birds and museum specimens (wingspan, wing and tail in millimetres, weight in grams). There are no significant size differences between immatures and adults so their measurements have been combined. For museum specimens, weights and wingspans refer to birds measured prior to preparation; wing and tail measurements taken from preserved specimens.

	Wingspan				Wing				Tail				Weight			
	$\bar{x}$	SD	Range	n	$\bar{x}$	SD	Range	n	$\bar{x}$	SD	Range	n	$\bar{x}$	SD	Range	n
<b>Males</b>																
Live Birds	301.2	6.9	288-318	15	92.5	4.9	86-101	15	77.6	6.0	72-88	15	34.4	2.6	29.75-38.5	11
Museum Skins	296.0	7.5	288-305	6	95.0	4.3	88-105	30	80.5	4.4	72-91	24	36.4	2.2	34-40	6
<b>Females</b>																
Live Birds	256.5	5.9	241-266	27	78.3	3.1	71-85	29	67.3	3.0	61-73	29	23.0	2.5	20-28.5	18
Museum Skins	250.7	4.2	246-254	3	80.0	3.2	73-86	18	67.2	2.4	64-71	15	22.5	2.6	19.5-24	3

approached those of males (29.75-38.5 g), however, the three heaviest females (26, 28 and 28.5 g) were all recorded as "about to lay" based on the condition of the cloaca; otherwise females weighed less than 25 g.

Measurements presented in Table 1 should allow separation of all post-juvenile birds and older juvenile birds for which primaries are fully emerged. Birds with winglengths exceeding 86 mm can be considered males even if the primaries are not fully grown. Adults may also be sexed on the basis of soft part colours.

### AGEING

Within each sex, the prime indicator of age of post-juvenile birds is the colour of the soft parts.

**JUVENILE** (Figure 1a): Separation of nestlings and recently fledged Rufous Songlarks from other brown, mottled, terrestrial species can be achieved using the unique colour pattern inside the mouth (Figure 2; NPIAW 1982: 281; Boles and Longmore 1985) and the rufous rump that appears quite early in the emergence of the first plumage.

Juveniles can be separated from older birds by: (1) the laxer, fluffier plumage; (2) much heavier streaking on the breast; (3) orange-yellow inside mouth; (4) very prominent inside mouth markings, including those on the palate. Too few specimens in this plumage have been examined to determine whether there are plumage or soft part

differences between sexes. The age category is 'J', following the ageing system adopted by the Australian Bird and Bat Banding Scheme.

**IMMATURE:** Sexes are similar, except for size, and in plumage resemble the adult female. In comparison with the adults, the rump is duller rufous, the crown paler brown and the breast shows a greater amount of mottling. The gape is bright yellow, as is the tongue, which retains black spots on the barbs, although these are less prominent than in juveniles. At what stage the yellow changes to the colour of the adult (black – males; pink – females) is not known. The bill is grey on the upper mandible, horn (males) or pinkish-horn (females) on the lower. Claws are pinkish or pinkish-horn. Juvenile rectrices are retained and exhibit pointed tips before becoming abraded. The skull retains some unpneumatized portions along the midline through much of this stage and should be visible if 'skulling' (external examination of skull pneumatization) live birds (Baird 1964). The age category is '1' or '2-'.

**Males** (Figure 1b). While soft part colours are diagnostic age characters in males, plumage features are also useful: in the immature, the supercilium is narrower and less obvious than in adults and the dark brown markings of the upper breast are more prominent. As adult males have black palates (Cleland 1913) and bills, birds exhibiting a colour change from yellow to black can be considered late immatures (2-).

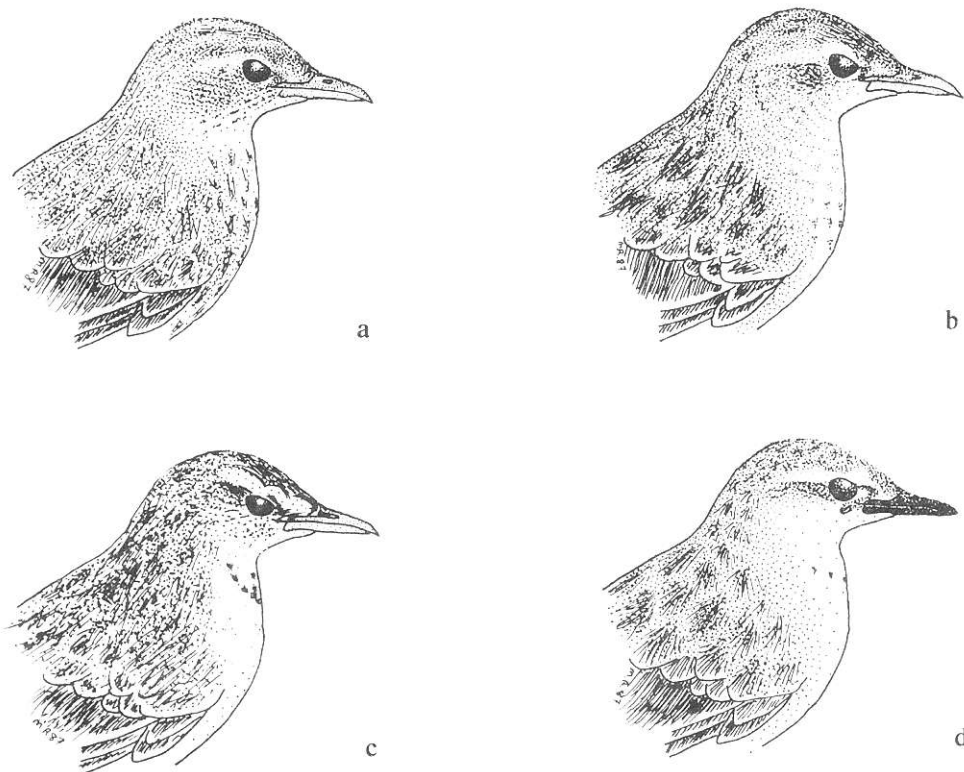


Figure 1. Plumage and soft part colours of Rufous Songlarks. a. Juvenile. b. Immature male. c. Immature and adult female. d. Adult male.

*Females* (Figure 1c). Separation of immature and adult females can be difficult. Useful characters are the immature's slightly greater degree of mottling on the breast, brighter yellow gape and the yellow (not pink) tongue and inside mouth. Timing of the change from yellow to pink is not known but presumably is near the annual moult. Individuals showing an intermediate condition can be considered 'old' immatures (2-). Those which cannot be confidently assigned to either immature or adult should be scored as '1+'.

## ADULT

*Males* (Figure 1d). Adult males are easily recognized by their black upper and lower mandibles, tongue, gape, inside bill and claws. Compared with those of immatures, the supercilium is wider and more prominent, the breast only faintly mottled and the ends of the tail feathers more squared. Adult males should be scored as '2+'.

A number of books refer to a colour change of adult male bill colour in the non-breeding season. The live birds and the museum specimens provide no evidence to support this suggestion, as black-billed birds were recorded throughout the year and all pale-billed males for which skull condition was recorded were not fully pneumatized. Further information is desirable, particularly from northern Australian birds during the non-breeding season.

*Females* (Figure 1c). Adult females have grey upper and horn lower mandibles, pinkish-horn claws, pale yellow gapes and pink inside of the beak. This plumage is illustrated in photographs by Norman Chaffer in NPIAW (1982: 218) and Reader's Digest (1986: 435). The tongues are pink but vary in the amount of black retained. All birds handled by Smedley carried dark spots on the barbs and some had the distal portion of the

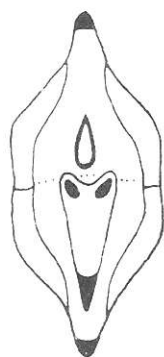


Figure 2. Inside mouth of nestling Rufous Songlark showing distinctive pattern of spots.

tongue tipped black or grey, while the tongues of others were edged all round with black or grey. This variation in tongue colour may provide a useful ageing character for female Rufous Songlarks when more information on its timing is obtained. Data are insufficient at the moment; no birds were retrapped during the study, so individual changes in tongue markings could not be detected. Any females with pink palates should be considered as '2+'.

## MOULT

Though few of the museum specimens exhibit moult, it is possible to make some tentative generalizations about the extent and timing of plumage changes.

A juvenile specimen acquiring immature plumage is undergoing only a body moult, indicating that the post-juvenile moult is incomplete, with rectrices, remiges and wing coverts retained until the subsequent moult. Subsequent moults appear to involve a complete replacement of all feathers. Months in which moult (immature to adult, adult to adult) has been recorded range from November to August (museum specimens; Hall 1974; Rogers *et al.* 1986) whereas fresh plumage has been noted in birds collected in April, May June and August and very worn plumage in birds taken in October, December, January and May (Boles, pers. obs.; Hall 1974).

If the annual moult follows breeding, as it does in most Australian passerines, these dates indicate rather variable timing of reproductive activity from year to year and between geographic localities (the records above come from five states). This species may breed two or three times in good seasons (Beruldsen 1980) and is migratory (Blakers *et al.* 1984), both characteristics that can significantly affect the timing and completion of moult.

The duration of the immature features may be indicated by birds encountered by Smedley at Back Yamma State Forest on 5 November, 1983. This species usually arrives in the Parkes district in late September to breed and was not present at this site four weeks prior to the November visit (N. Schrader, pers. comm.). During November, males were performing a high level of territorial display and a number of nests with complete clutches of four or five eggs were found. Immature songlarks of both sexes were caught on that occasion, indicating that they were birds of the previous year; a breeding season that was both early and prolonged was unlikely in 1983 as in that year most of inland Australia was severely drought-affected. From this it can be presumed that the immature plumage is retained at least until the following breeding season. Rogers *et al.* (1986) observed immatures in body moult in the spring following fledging.

## CONCLUSIONS

The results of these studies show that the Rufous Songlark can be reliably sexed using routine banding measurements (Table 1) and aged by noting soft part colours and plumage features. They have been summarized as a Bird in the Hand (Boles and Smedley 1988).

If wingspan measurements can be taken, birds with wingspans greater than 287 mm are male and those less than 269 mm are female. Weight is the next most reliable index. If care is taken to eliminate females that are about to lay, birds with weights greater than 29 g are male and those less than 25 g are female. There is overlap in the length of the tail between the sexes and probably in winglength as well, but if these measurements are used in combination with wingspan and weight, there is no difficulty in differentiating the sexes.

## ACKNOWLEDGEMENTS

Neville Schrader, Geoff Bell and Jeff Hardy kindly allowed the use of their banding data to augment that presented here. Belinda Gillies (Museum of Victoria) and Shane Parker (South Australian Museum) made specimens under their care available for use. Martyn Robinson drew the illustrations. Members of the Ornithological Techniques class worked out the preliminary sequence of plumages.

## REFERENCES

- Baird, J. (1964). Aging birds by skull ossification. *EBBA News* 27: 162-163.
- Beruldsen, G. (1980). A Field Guide to Nests and Eggs of Australian Birds. Rigby, Adelaide.
- Blakers, M., Davies, S. J. F. and Reilly, P. N. (1984). The Atlas of Australian Birds. RAOU and Melbourne University Press, Melbourne.
- Boles, W.E. and Longmore, N. W. (1985). Colours and markings of the mouths of nestling Australian songbirds. *South Aust. Ornithol.* 29: 213-219.
- Boles, W. E. and Smedley, D. I. (1988). Bird in the Hand: Sexing and ageing the Rufous Songlark *Cincloramphus mathewsi*. *Corella* 12: 25.
- Cleland, J. B. (1913). The colouration of the palate and pharynx of Australian birds. *Austral Avian Rec.* 2: 1-5.
- Disney, H. J. (1967). Sexing passerine birds by cloacal examination. *Aust. Bird Bander* 5: 36-37.
- Disney, H. J. (1974). Topography, colour and measurements. In Bird in the Hand. (Ed. Lane, S. G.) The Bird Banders Association of Australia, Sydney.
- McGill, A. R. (1970). Australian Warblers. The Bird Observers Club, Melbourne.
- National Photographic Index of Australian Wildlife [NPIAW]. (1982). The Wrens and Warblers of Australia. Angus and Robertson, Sydney.
- Reader's Digest. (1986). Complete Book of Australian Birds. 2nd edition. Reader's Digest Services Pty Ltd, Sydney.
- Rogers, K., Rogers, A., Rogers, D., Lane, B. and Male, B. (1986). Bander's Aid. A guide to ageing and sexing bush birds. Published by the authors, St. Andrews.
- Rooke, I. J. (1976). A measurement for sexing New Holland Honeyeaters. *Aust. Bird Bander* 14: 72.

---

Corella, 1988, 12(1): 18-21

## THE USE OF MIST NETS AND RADIOTELEMETRY IN THE STUDY OF THE GROUND PARROT *Pezoporus wallicus* IN BARREN GROUNDS NATURE RESERVE, NEW SOUTH WALES

RICHARD JORDAN

Barren Grounds Bird Observatory, P.O. Box 3, Jamberoo, N.S.W. 2533

Received 15 May, 1986

Methods for trapping and radio-tracking Ground Parrots were examined at Barren Grounds Nature Reserve, Jamberoo, NSW. Two methods, involving mist nets, were successful in capturing the parrots. A technique for attaching radio transmitters to the birds is described, and the operating lives of two battery types are compared.

## INTRODUCTION

The Ground Parrot *Pezoporus wallicus* is a rare bird found in the coastal heathlands of south-eastern and south-western Australia and Tas-

mania (Pizzey 1980). Due to the parrot's secretive nature, and the dense vegetation cover of its habitat, very little is known about the species' behaviour or ecology (Meredith, Gilmore and Isles 1984). One means of overcoming the observ-