Ageing and Sexing Eastern Rosellas

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In field studies of birds it is often necessary to age and sex individuals. Both sexes of Eastern Rosellas *Platycercus eximius* have similar plumage but that of adult males, particularly the red feathers of head and breast, are brighter than those of females and young birds. Another differences is the two rows of spots on the underwing coverts and remiges; these are present in young birds, retained to a varying degree in adult females and lost in adult males (Lendon 1941, Smith and Brereton 1976).

During studies of Eastern Rosellas we discovered that differences between plumages and underwing patterns of young and adult birds and of males and females were not always sufficient for us to confidently assign ages and sexes. In this paper we present further information on differences in Eastern Rosellas.

Information presented here comes from a capture-recapture study of Eastern Rosellas at Eathorpe, 10 km east of Armidale, New South Wales (30°31'S., 151°40'E.). From 1964 to 1975 records were kept of the underwing pattern of spots of individuals that were initially caught in nests or as young birds and recaptured one to several years later. Records also were kept of the colour of the beak and length of tail. In 1972 and 1973 birds were collected for an histological study of gonads (see Smith and Brereton 1976) and the weight and width of upper beak were recorded.

Birds were weighed in the field with an Ohaus Dial-O-Gram balance within half an hour of collection and to the nearest 0.1 g. Records used in analysis were from birds collected in 1972 and 1973 from January 1 to August 30; outside this period there was enlargement of reproductive organs (Smith and Brereton 1976). Length of the longest feather of the tail, from the point of emergence of the calamnus to tip of the rachis, was measured to the nearest millimetre. Birds in which middle feathers of the tail were worn or that were in moult were excluded from analysis. Width of the upper beak at the widest point was measured to the nearest 0.1 mm.

Significance of differences in mean weight, width of upper beak and length of tail of age and sex classes were tested using analysis of variance. Ninety-five per cent confidence intervals for mensural characters in Table 2 estimate the range into which 95% of measurement would occur. For example, 95% of adult males weigh from 103.6 (116.7-13.1) to 129.8 (116.7+13.1) g.

Eastern Rosella chicks fledge in summer, have their first complete moult the following year, between November and April, and a further complete moult each subsequent year, between December and May (unpublished data). The term 'young' in this paper is used for birds in their first year that have not undergone a complete moult and 'adult' for birds in their second or subsequent years that have undergone one or more complete moults.

Results

Plumage

Adult males usually had brighter plumage than females, particularly the red of the head or breast. Napes of males were usually bright yellow and of females pale yellow, sometimes tinged with pale green, but some birds were not sufficiently distinct for this difference to be a reliable indicator of sex (see Pizzey 1980). Plumage differences were most obvious in mid-winter when birds had just completed the annual moult, although even at this time there were a few birds with plumages intermediate between that of males and females. In late summer, when plumages were old, faded or worn, plumage differences between sexes often were not clear cut. At fledging young birds had orange or yellow beaks, which changed to off white, similar to adults, during the next few months.

Four birds were initially caught as nestlings or had yellow beaks when first captured and when recaptured in later years had distinctive adult male plumage. All four birds had a well

defined row of from four to twelve spots on their first set of underwing coverts and a well defined row of from eleven to seventeen spots on their first set of remiges but had no spots on their second and subsequent sets of underwing coverts and remiges.

A further 22 birds had two well defined rows of spots on the underwing at initial capture but when recaptured in later years had adult male plumage and either no spots on the underwing or only a few poorly defined spots on the remiges. If a few spots occurred on the second set of remiges they also occurred on later sets of remiges; for example a male had five spots on its second to sixth set of remiges. The number of spots on underwing coverts of young males ranged from three to twelve and on remiges ranged from 11 to 17.

A bird was initially caught as a nestling and when recaptured 19 months later had female plumage. This bird had three spots on the second set of underwing coverts and 12 on the second set of remiges. Nineteen other birds had well defined rows of spots on underwing coverts and remiges at initial capture and when recaptured in later years had female plumage and a few or no spots on the underwing coverts and a reduced number on the remiges. Loss of spots occurred mainly at the change from the first to second set of coverts and remiges. Representative examples of patterns of spots are given in Table 1. Spots on underwing coverts of young females ranged from five to twelve and on remiges from 11 to 16; on underwing coverts of adult females from 0 to 7 and on remiges from 7 to 14.

Mensural Characters

Mean weight, mean width of upper beak and mean length of tail differed in adult males and females but in all these characters measurements on individual males or females overlapped (Table 2). Thus large males and small females can be reliably sexed using size differences but small males and large females are of similar sizes.

Conclusions

While there is dimorphism between sexes and ages of Eastern Rosellas, the plumage and mensural characters presented here are not sufficiently clear cut for all individuals to be assigned sex and age class accurately. Adult males can be reliably distinguished from other classes by the absence of spots on the underwing. A few adult males have a few faint spots on the remiges but these are less numerous and less distinct than spots on the remiges of other classes. Recently fledged young birds can be identified by yellow or orange beaks.

Separation of adult females from first year birds of either sex is often difficult. Birds with no spots on the underwing coverts and a row of spots on the remiges are adult females. Birds with both rows of spots may be adult females or young birds of either sex and their age and

TABLE 1

Number of spots in underwing coverts (C) and remiges (R) of first and later plumages of female Eastern Rosellas. Birds in plumage 1 are in their 1st year and in plumage 7 in their 7th year.

Bird	Plumage													
	1		2		3		4		5		6		7	
	C	R	C	R	C	R	C	R	C	R	C	R	C	R
1*			3	12										
2	12	15	7	14	7	13			7	12				
3	11	13	3	11			0	11						
4	8	13	0	9			0	8					0	8
5	9	13	6	11	3	6								
6	6	11	0	8	0	7								
7	7	13	0	8	0	8	0	6						

* First caught as nestling but underwing pattern of spots not recorded.

TABLE 2

Weight, width of upper beak and length of tail of adult male and female Eastern Rosellas. Given for each character are mean ± 95% confidence interval (number of birds). P is probability that observed differences are due to chance.

Character	Male	Female	P
Weight (g)	116.7 ± 13.11 (41)	102.2 ± 13.11 (18)	>>0.001
Width of upper beak (mm)	11.7 ± 0.69 (68)	10.6 ± 0.69 (27)	>>0.001
Length of tail (cm)	17.3 ± 1.44 (25)	16.0 ± 1.44 (25)	>>0.001

sex can be determined only if they are recaptured in a later plumage. Loss of both rows of spots in the later plumage shows the bird was a young male, while loss of spots on underwing coverts or a reduction in the number of spots on underwing coverts and remiges shows the bird was a young female.

From December to mid-January birds in their first year can be distinguished by their new plumage, which contrasts with the worn and faded plumage of adult females at this time. From about mid-January to late April birds in their first year can be distinguished as they are either not moulting or are moulting only body feathers, while adult females are moulting remiges and body feathers (unpublished data).

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