

PRIMARY MOULT OF CURLEWS AT THE WASH, ENGLAND

by Ian P. Bainbridge and C.D.T. Minton

This note describes the primary moult of Curlews *Numenius arquata* caught at the Wash, England between 1963 and 1978. All birds wintering at the Wash are from Scandinavia and central western Europe (Bainbridge and Minton 1978). The moult of British west coast populations, which contain British breeding birds may be different. The primary moult of 399 birds was recorded by Snow's (1967) method. Moult scores were calculated ignoring the minute outermost primary.

Primary moult of Curlews at the Wash commences almost immediately the birds arrive in autumn, starting in late June and July, and finishing between the middle of October and early November (Figure 1). This agrees with the findings of Sach (1968) and Boere (1976) at the German and Dutch Waddensees. Presumably these birds have similar origins to Wash birds.

No difference in the timing of moult between males and females was found. Witherby *et al* (1942) and Bannerman and Lodge (1961) suggest that females arrive first on British coasts in autumn but this is not so for birds trapped at the Wash (Bainbridge and Minton in prep). Almost all adults caught between July and October are in primary moult; there is no evidence of non-moulting birds at or migrating through the Wash in early autumn. Almost all ringing recoveries of Wash-trapped Curlews are on the Wash, suggesting little movement of moulted birds in early winter (Bainbridge and Minton 1978). Sach (1968) suggests Curlews are relatively sedentary during moult.

A line fitted by eye through the median moult scores of the large samples ($n > 30$) gives an approximate duration of primary moult of 100 days, similar to Boere's (1976) findings. Thus Curlews moult at a similar rate to many other waders (Morrison 1976, Pienkowski *et al* 1976).

The innermost four or five primaries are shed almost simultaneously and in the first half of moult these feathers grow simultaneously. In the second half of moult two to four primaries are in simultaneous growth (Table 1). The apparent decrease in rate of primary moult seems typical of many waders (Holmes 1966, Morrison 1976, Branson & Minton 1976) and may be due to the recording method. However, the outer primaries are large and more resources are required to advance such a feather by a single score compared with smaller inner ones. Holmes (1966) showed that the increase in time taken to replace a single primary in Dunlins *Calidris alpina* coincided with the onset of moult of secondaries and retrices. Boere (1976) showed that most secondary and tail moult occurs in Curlews when primary moult scores are between 25 and 50. Thus the resources available for moult may be distributed between a larger number of moulting feathers, effectively slowing down the rate of primary growth. The seventh primary is not normally shed until the first three or four are fully grown; the eighth after five are fully grown, and the ninth and tenth after six are fully grown. The ninth and tenth primaries are shed almost simultaneously (Figure 2).

A small number of non-breeding Curlews summer at the Wash (Bainbridge and Minton 1978). Two of three birds caught in late May had begun primary moult (score 2, individual feather scores 1⁴⁰). Of nine birds caught on June 30, seven had not started to moult or had just begun and these were probably the earliest autumn immigrants. The other two birds had scores of 19 and 20 (about 40 days into primary moult) and had presumably summered at the Wash. In July some birds are well advanced in moult (Figure 1) but in August these individuals cannot be distinguished from the majority of other moulting birds. If the early birds take 100 days to moult, they will complete in early September. A similar period and duration of primary moult is found in Grey Plovers *Pluvialis squatarola* summering at the Wash (Branson and Minton 1976).

Acknowledgements

For financial support to the Wash Wader Ringing Group, we thank the Natural Environment Research Council. For their enthusiastic fieldwork, we thank the group's members, and for constructive criticism of this note, we thank Graham Appleton, Nicholas Branson, William Dick, Harry Green, Philip Ireland, John McMeeking and Mike Pienkowski.

Summary

Primary moult of Curlews which spend the autumn and winter at the Wash takes about 100 days, starting in late June and July. No differences between the sexes are apparent. The sequence of primary shedding and replacement is described and resembles that of most waders. The apparent slowing of primary moult may be related to the start of moult of tail and secondary feathers. Birds which summer at the Wash start to moult in late May, and probably finish in mid September.

References

- Bainbridge, I.P. and Minton, C.D.T. 1978. The migration and mortality of the Curlew in Britain & Ireland. *Bird Study* 25: 39 - 50
- Bainbridge, I.P. and Minton, C.D.T. (in prep). Sexual dimorphism and sex ratios of the Curlew.
- Bannerman, D.A. and Lodge, G.E. 1961. *The Birds of the British Isles*. Vol IX. Edinburgh.
- Boere, G.C. 1976. The significance of the Dutch Waddensee in the annual life cycle of arctic, subarctic and boreal waders. Part 1. The function as a moulting area. *Ardea* 64: 210 - 291
- Branson, N.J.B.A. and Minton, C.D.T. 1976. Moult, measurements and migrations of the Grey Plover. *Bird Study* 23: 257-266
- Holmes, R.T. 1966. Moult cycle of the Red-backed Sandpiper (*Calidris alpina*) in western North America. *Auk* 83: 517-533
- Morrison, R.I.G. 1976. Moult of the Purple Sandpiper *Calidris maritima* in Iceland. *Ibis* 118: 237 - 246
- Pienkowski, M.W., Knight, P.J., Stanyard, D.J. and Argyle, F.B. 1976. The primary moult of waders on the Atlantic coast of Morocco. *Ibis* 118: 347 - 365
- Sach, G. 1968. Die Mauser des Grossen Brachvogels, *Numenius arquata*. *J.Orn.* 109: 485 - 511
- Snow, D.W. 1967. *A guide to moult in British birds*. B.T.O. Field Guide No. 11. Tring
- Witherby, H.F., Jourdain, F.C.R., Ticehurst, N.F. and Tucker, B.W. 1942. *The Handbook of British Birds*. Vol. IV. London
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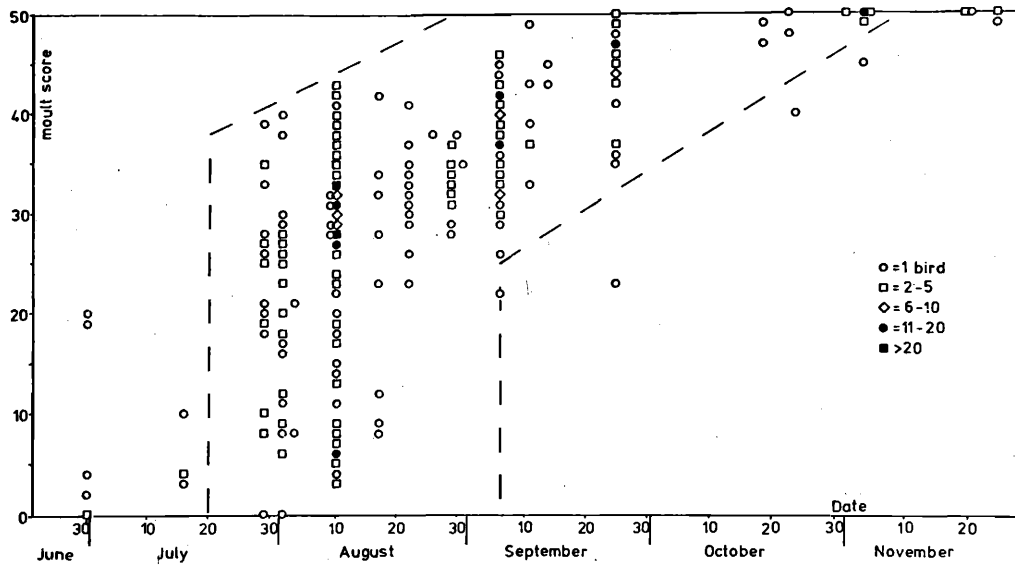


Figure 1. Distribution of Curlew moult scores with date. The area enclosed by the dashed lines indicates the distribution of Curlew moult scores in the Dutch Waddensee (Boere 1976).

TABLE 1. MEAN NUMBER OF PRIMARIES IN ACTIVE MOULT RELATIVE TO MOULT SCORE OF ADULT CURLEWS AT THE WASH

Moult score	Mean No. primaries in active moult	s.d.	No.
1	1	-	0
2	2	-	3
3	3	-	3
4	4	-	2
5 - 9	4.80	0.52	20
10 - 14	5.45	0.52	11
15 - 19	5.19	1.60	16
20 - 24	4.40	1.82	20
25 - 29	2.86	0.45	78
30 - 34	2.65	0.60	93
35 - 39	2.73	0.71	62
40 - 44	3.08	0.52	51
45 - 47	2.07	0.26	27
48	2	-	2
49	1	-	11

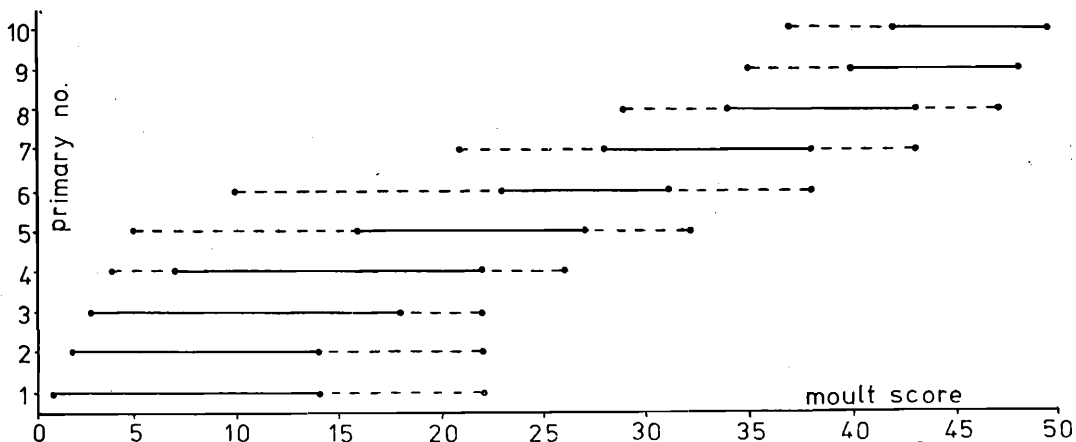


Figure 2. Plot of duration of moult of individual primary feathers versus moult score. The two extremes of each line are the earliest recorded start and latest finish of moult of that primary. The solid part of the line represents the period when that primary is in moult in all birds.