



SHORT NOTE

## Some observations on the occurrence of three generations of primaries in Common Terns *Sterna hirundo*

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In adult Common Terns *Sterna hirundo*, the post-nuptial primary moult begins either near the breeding grounds (Cramp 1985) or upon arrival at the wintering grounds (L Underhill pers comm). Moult starts with the innermost primary (p1, numbered descendantly) and all birds initiate moult by October (Cramp 1985, Underhill & Prŷs-Jones 1986). Common Terns that begin primary moult whilst in European waters suspend moult during southward migration (Ginn & Melville 1983, Cramp 1985) but this may be a less widespread occurrence than first suggested (Ward 2000). Post-nuptial primary moult is completed between January and early March, but before then there is a pre-nuptial, proximal to distal primary moult wave initiated between December and February (Harrison 1975, Underhill & Prŷs-Jones 1986, Baker 1993). This second moult wave, which begins after full replacement of six or seven primaries in the first moult wave, is usually stopped on the renewal of p4-5 between March and April. Thus, there is a clear age difference between the primaries replaced at different times. This produces a visible contrast between the older, dark outer primaries and the newer, pale inner primaries. Some birds start another series from p1 in late winter, then arrest at p1-4 before spring migration (Baker 1993, Ward 2000).

Second-summer Common Terns are indistinguishable from older birds (Wood & Ward 1996); both groups can show two or three age series of primaries (Ward 2002). The first two primary moult series in second-summer birds may, however, be completed or arrested up to six and three months later, respectively, than in older birds. This note examines the extent to which all three generations of primaries are present amongst Common Terns in late summer in northeast England.

Common Terns originating from North Sea and Baltic breeding colonies congregate between July and September at Seal Sands, Teesmouth, northeast England

(54° 37'N 1° 10'E; Ward 2000), where we trapped 1,409 birds using mist nets during late July to early September, 1995 to 2001. The majority of birds were mist-netted at night using tape lures and painted decoys. As with waders (Insley & Etheridge 1997), this approach may bias the sample towards immature (R Ward unpublished data) or non-breeding birds, although it is unlikely to be biased in relation to the extent of moult. RMW noted the age series for each primary on 507 non-juvenile birds. The moult limit between the post-nuptial and first pre-nuptial series can be identified by the degree of abrasion of the feather tips and the greyish bloom that conceals the underlying dark outer primaries (Ullman 1989, Craik 1994). Feathers of the second pre-nuptial moult are separable from the earlier series by an absence of abrasion, by being a slightly darker uniform grey in contrast to a faded brownish-grey, and by the waxy sheen present on new feathers. First-summer Common Terns rarely occur in Britain (White & Kehoe 2001) and none were included within this analysis.

Twenty percent (101) of birds had between one and four inner primaries of the third age series (Table 1). Sixteen of these birds were actively moulting their innermost primaries, which confirms that they were not first series primaries in suspended moult. Fifty-two of the 507 birds (17%) were ringed as chicks or juveniles,

**Table 1.** The frequency of third series primaries observed in Common Terns at Teesmouth. For eight birds, the third series of inner primaries was broken by one unreplaced second series primary.

Number of third series primaries	Number of birds
0	406
1	26
2	42
3	25
4	8

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and so were of known age. Third series primaries were present on nine of the 27 birds known to be in their second summer, but were absent in all other known age classes. Comparison of the ratios of those birds with and without third series primaries suggests that the known-age birds were representative of the population sampled ( $\chi^2_1 = 0.248$ , NS).

From the nine known second-summer birds retaining a third primary series, three had initiated post-nuptial moult of the primaries (the next primary series). Our data for the occurrence of three primary generations are likely to be an underestimate, as some individuals may have already moulted the third primary series prior to capture, so we were unable to justifiably examine the difference in moult scores between birds with and without a third primary series (but see Ward 2002 for age-related differences in moult scores).

Most Common Terns return to the breeding grounds in their second summer (Haynes & Blokpoel 1978, Becker & Wendeln 1997) prior to their first breeding attempt in the following year (Becker *et al* 2001). Second-summer birds are, therefore, likely to have more resources to devote to pre-nuptial moult than do adults, which might explain why some undertake a third series of primary moult whereas adults do not. The duration and extent of the second series of primary moult (Baker 1993) amongst birds at Teesmouth was greater in second-summer birds than the older age classes (Ward 2002). However, of the known second-summer birds examined, no significant difference was found in the extent of the second primary series between those with and without a third primary series (Mann-Whitney U-test,  $W = 122.5$ , NS,  $n = 27$ ).

With Common Terns, the occurrence of a third primaries series is perhaps more common than previously evident from the literature, and our study suggests that third series primaries are limited to second-summer birds. Previous studies either make no reference to three generations of primaries (Koopman 1996) or suggest their presence to be rare (Cramp 1985), but this is not surprising since most published data come from breeding birds aged three or more years old (Craik 1994, Koopman 1996, Becker *et al* 2001), or from techniques which were unlikely to detect feather age differences (Walters 1985).

Our study suggests that the presence of third series inner primaries may be restricted to 20% of second-summer birds only. Using the presence of third series primaries to age Common Terns as second-summer birds requires further testing; it is possible that they occur rarely in older birds and may be recorded in a larger sample. Given the complexities of wing moult in terns, it is recommended that all birds, other than juveniles or first-summer caught in late summer, continue to be aged in the hand as one age group, ie second-summer or older, as previously advised by Wood & Ward (1996).

## ACKNOWLEDGEMENTS

We thank the many individuals who participated in the tern catches taken by Tees Ringing Group, and E Bridge, J Hay and S White for valuable comments on earlier drafts. RMW is very grateful to the late Professor Peter Evans for his encouragement with this study.

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(MS received 15 May 2003; MS accepted 19 April 2004)