THE KNOT

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The Knot <u>Calidris canutus</u> has a circumpolar distribution. The nominate race breeds on a few islands of the north-east Canadian Arctic, Greenland, Spitzbergen and Siberia (apart from Wrangel Island). These birds winter in West Europe and parts of Africa. The European distribution in winter is relatively well known. The importance of West Africa as a wintering area has been recognised only recently.

Bannerman (1961) stated "the Knot has no winter quarters anywhere in Africa". The distribution in Africa is still poorly known, but Knots probably occur abundantly only in two parts of the continent, south Morocco/Mauritania and southern Africa. However, many areas have not been adequately covered. Recent surveys of the north west African coastline between Tangier and the Senegal River, indicate that there is a winter population of at least 135 000 Knot in some years.

The principal areas for Knot in southern Africa are Langebaan 4 000 to 6 000 birds in [illegible] and [illegible]; Sandwich Harbour 650 birds in February 1977 ([illegible]) [illegible] birds at the Berg River Estuary. Smaller [illegible] of [illegible] 100 have been reported from Walvis Bay, [illegible] River Mouth, Breede River Mouth, Port Elizabeth and [illegible]. It is doubtful if other important wintering grounds will be found in southern Africa between Walvis Bay and Durban.

The wintering totals of Knot in north-western and southern Africa are estimated at 145 000 as compared with 609 000 in western Europe. It could be suggested that the African population is of less importance, but we are trying to show this to be erroneous. A study of ringing recoveries and a significant difference in bill lengths indicates that the African

population is mainly composed of Siberian breeding birds whereas those wintering in north-western Europe are from Greenland and the north Canadian Arctic. Although the relative breeding densities of the two populations are not known, it is believed that the Canadian Arctic/Greenland population is greater than the Siberian. If this is so the relative wintering populations would follow the same density ratio.

Geographical Origins

Identifications of the two populations according to plumage can not be undertaken. Bill and wing lengths have proved useful in determining the origins of several wader species including Dunlin and Redshank. Measurements of bill lengths of Knot from various localities at different times of the year clearly indicate two distinct groups, with those from Britain and France in mid-winter being similar to those from Iceland, but South African and Mauritania/Morocco measurements being significantly larger ($P < 0,001$).

Differences in bill lengths could be due to a number of factors all of which were examined in detail. These include changes of bill lengths of individuals due to seasonal changes at the feather margin at the base of the upper mandible and seasonal changes in the growth or wear of the rhamphotheca. In addition differences due to age and sex composition of the samples as well as geographical variations were examined. The latter was found to be the cause of the significant difference in bill length.

Difference due to Geographical Variation

There are few published bill lengths from the breeding areas. Skins in the British Museum have provided 20 measurements from or near the breeding grounds in Greenland (mean 32,5 = /-S.E. 0,3 mm) and 6 from Siberia and Eastern Europe, the latter being almost certainly of Siberian origin (mean 34,2 = /-S.E. 0,7 mm). This difference finds some support from the limited information available in the literature.

In view of the geographical position of Iceland and numerous ringing recoveries we conclude that the shorter billed group are of Greenlandic and North Canadian origin. Museum specimens and literature suggest that the larger billed birds come from Siberia. We cannot, however, decide from our analysis of bill length whether the winter populations are each derived from single breeding areas or, if not what proportions of each breeding population are present in each wintering area. The difference between the two populations is too small to allow separation of the modes in a mixed sample. However, the lack of intermediate mean bill lengths suggests little mixing.

Ringing Recoveries

Available ringing recoveries were used to trace the international movements of Knot. Significantly there have been no recoveries in Siberia of British ringed Knots, despite the large numbers ringed. This suggests that few if any Siberian Knots occur regularly in the British Isles. However, the British ringed waders of other species have been recovered in or near similar breeding ranges, e.g. 3 out of 577 Curlew Sandpipers ringed in Britain have been recovered. British ringed Knot have been recovered in Iceland (15), Greenland (10) and Canada (3). Conversely the recoveries also show that most Greenlandic and Canadian Knots (represented by Icelandic ringed birds) have been found to winter in the coasts of the Irish Sea, North Sea and Bay of Biscay. Within this area Knots tend to move progressively westwards during the winter after arriving in early autumn on both sides of the North Sea.

Recoveries of Knots ringed in the British Isles show a movement between the Arctic (Canada), Greenland, Iceland and the west European coasts, and confirms the distribution of the population. It is of note that few birds have been recovered after December on the west European coast. To complicate the picture, there are exceptional years where autumn passages of Siberian breeding species have been noted on the eastern

shores of the British Isles. In 1963, 1969 and 1970, juvenile Knots ringed on autumn passage were recovered in Africa. All these years were noted for heavy passages through Britain of Curlew Sandpipers and Little Stint, species which breed only in Siberia. It is therefore not surprising that Knots ringed in these years in western Europe have subsequently been found in Africa.

Recoveries of birds ringed in the Baltic clearly indicate a migration along the west European seaboard in August/September and a return in May with only two recoveries in Europe during winter. This pattern differed markedly from recoveries of Islandic and British ringed birds and it is suggested that these birds are of a different origin. Comparison of dates and locations of recoveries of Knots ringed in Norway with those of presumed Greenlandic/Canadian and Siberian origin make it clear that birds of both populations pass through south-west Norway.

South African ringing recoveries and birds recovered in South Africa show a pattern similar to the Baltic. However, only an autumn migration of mainly young birds along the west European seaboard may be documented by these recoveries. A juvenile ringed in Mauritania has been controlled at Langebaan in its second year. However, the difference in timing of primary moult makes it clear that post juvenile Knots moulting in Mauritania do not subsequently indicate a route used for the spring migration and a direct passage involving long overland flights is suggested.
