

Visible migration of Knots at Sheringham, Norfolk: some preliminary results

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Observations of migrating birds made from the ground do not necessarily reflect overall migration patterns, since unknown numbers of birds can pass undetected (and in different directions) at higher altitudes. Migrant waders may only fly close to the ground (and so be visible) when forced to do so by adverse winds at high altitudes (e.g. Piersma & Jukema 1990). Although observations of visible migration, other than of birds departing from a staging area (e.g. Piersma *et al.* 1990), must therefore be treated with caution, they can be helpful in providing some direct evidence of when at least some birds are actively migrating, especially when the observations have been made over long periods of time.

There are few sites in Britain other than at bird observatories where systematic counts of migrant birds have been made over long periods, and even fewer that permit visual recording of migrating birds. One such location is at Sheringham on the north coast of Norfolk in eastern England. Systematic counts of all birds present and/or moving through a small, clearly defined area have been made regularly since 1976, and recorded as a daily log during 1976 - 1982 and 1987 - 1988. This note summarizes the observations of migrating Knots *Calidris canutus* made during this period. Sheringham is particularly well placed for following wader migration since it lies on a direct route between the major wader staging, moulting, and wintering areas of the Wadden Sea and the Wash. It is located about 10 km beyond the eastern end of suitable wader habitat on the north Norfolk coast, and there is no further suitable habitat for over 50 km further south and east.

In order to maintain comparability of data a daily log was written only if: a) the visit starts before sunrise,

and b) the visit is of more than four hours duration. This time period has been used because almost all visual migration occurs during the morning. Visits usually, however, last much longer than the minimum four hours.

Between 1976 - 1982 and 1987 - 1988 a total of 746 log entries were made, with most visits being during spring (March-May) and autumn (July-October) (Figure 1 top). During these observations a total of 13,386 Knots were seen, all of which were flying past. All seemed to be actively migrating and none landed. Almost all the birds were flying westwards (i.e. towards the north Norfolk coast and the Wash), only 236 birds (1.8%) were flying east.

The average numbers of Knots seen per day during each 'third-monthly' observation period varied greatly (Figure 1 bottom). There appears to be a peak of visual movement in late autumn (October-November), and a small peak in midwinter (January-February). Smaller numbers were seen in early autumn (July-September) and in spring (March-May). This pattern is, however, greatly influenced by large numbers of Knots being seen on just a few days. More than 50 Knots were recorded passing on only nine dates that together account for over 93% of the Knots observed. These summarized in Table 1. Seven of these dates were in late autumn, between 27 October and 27 December, with exceptionally large numbers (8,500 birds) passing westwards on 25 November 1978. The other two dates were both during cold weather in early 1979.

Although all the major late autumn movements were associated with north-westerly winds this may not in itself indicate the origin of the birds, since such winds in autumn characteristically produce strong

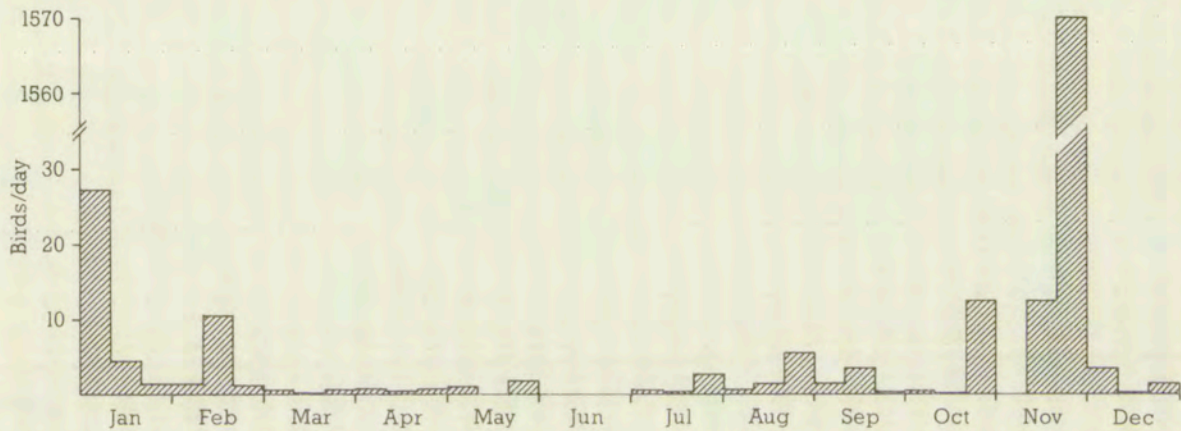
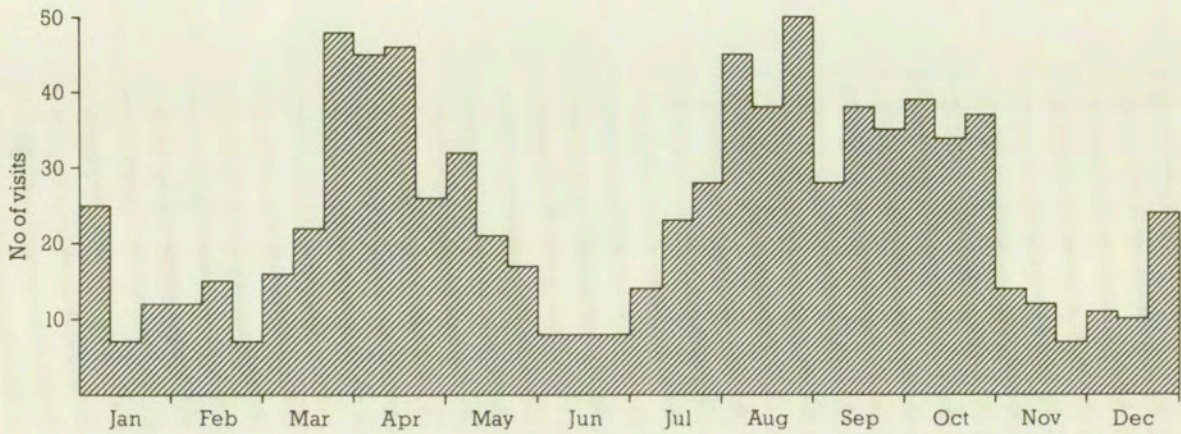


Figure 1. The number of days of observations of visual migration at Sheringham, Norfolk during 1976 - 1982 and 1987 - 1988 (top) and the seasonal distribution of the average numbers of Knots seen migrating past

Sheringham (bottom). Each month is divided into three parts: the 1-10th day, the 11-20th day and the 21st to the end of the month.

westerly visible migrations of birds with likely origins in the north and north-west, as well as from the east. Some of these movements of Knots were, however, associated with westerly movements of large numbers of Dunlins *Calidris alpina*, for example 900 birds on 22 November 1988 and 5,000 birds on 25 November 1978.

Although the subspecific identity of the Knots involved in movements past the north Norfolk coast are not known, most almost certainly belong to the Nearctic *islandica* population. The late autumn movements of Knots seem most likely to be direct evidence of the post-moult movements from the Wadden Sea to eastern England that are known from ringing recoveries and counts to occur at this time (Dugan 1981; Cramp & Simmons 1983; Davidson & Wilson 1992). The January and February movements seem to be interesting direct evidence of cold weather movements by Knots into eastern England from continental Europe.

The identities, origins and destinations of the small numbers of Knots moving in early autumn and in spring are more obscure. Could westerly movements in autumn be of *canutus* birds overshooting the

Table 1. Days on which more than 50 Knots were observed passing Sheringham, Norfolk. Wind is in Beaufort.

Date	no. of birds	wind direction	wind strength
13 Nov. 1977	130	NW	6-8
22 Nov. 1977	1,500	NW	7
27 Oct. 1978	451	NW	0-1
25 Nov. 1978	8,500	NW	1-3
26 Nov. 1978	180	NW	5-6
27 Nov. 1978	90	NW	6
21 Nov. 1987	700	NW	4
6 Jan. 1979	600	S/SSW	1-3
18 Feb. 1979	134	NE	1

Wadden Sea or *islandica* that had staged briefly on continental Europe? The small numbers of Knots seen in May were all moving eastwards. Were these *islandica* moving back late to stage in the Wadden Sea? But by late May all this subspecies should have been in Iceland or Norway (see Davidson & Wilson 1992), so perhaps a few *canutus* do stage during spring on the Wash?

All these must remain speculations, at least until the further analysis of the patterns of visual movements of waders including Knots, and incorporating data collected in 1989 and 1990, is complete.

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