

THE SPRING MIGRATION OF SANDERLINGS *Calidris alba* THROUGH BRITAIN IN 1979

(Results of the WSG Project on the Spring Passage of Dunlins, Sanderlings, Ringed Plovers and Turnstones through Britain - Part 2)

by P.N. Ferns

On the whole, rather few Sanderlings were counted during the course of the Spring Passage Project, and this is in accordance with their known habit of concentrating at a relatively small number of sites both during winter and when on migration (Prater & Davies 1978). Only on the Ribble and in Morecambe Bay were large concentrations counted (Fig.1). Numbers at the latter site are all the more remarkable in view of the fact that the wintering population is so small. This raises the possibility that the small numbers of birds encountered at other sites (Figs. 1-3) might in some way be atypical of the main mass of migration. They could, for example, have been birds whose migratory fat reserves had become prematurely exhausted and who had therefore been forced to stop off at sites which they would not otherwise have visited. Under such circumstances, the timing of passage might be expected to differ from that of the major sites. On the whole, this does not seem to have happened, but there were curious anomalies at one or two of the sites.

The counts at those sites where reasonable coverage was obtained, and where numbers were sufficiently large to show clear evidence of passage, are shown in Figs. 1-3. These have been arranged in a more or less systematic fashion with those from west coast sites in Fig. 1, those from the south and west in Fig. 2 and those from the east in Fig. 3. Passage at Collister Pill in the Severn Estuary was very clear cut, since the situation was not complicated by the presence of any wintering birds. The first significant influx did not occur until 3 May. Many of the new arrivals passed through very quickly and then a further influx occurred on 12 May. These birds also did not remain for long, perhaps because the site does not provide good feeding opportunities for this species. Although the birds were difficult to count, since they were intermingled with 5,000 or so Dunlin, the lower numbers around 10 May represent a real difference, and so the passage was definitely divided into two distinct phases. The pattern on the Ribble was broadly similar, but the less frequent counts in Morecambe Bay show no signs of a double peak. The overall peak date occurred later at the northern sites, being 28 May at Sunderland Point - Middleton Sands.

At Wembury, on the south coast of Devon, and at Southampton, a single peak occurred on 12 May, corresponding to the second wave of immigration in the Severn and the Ribble. In both cases, only small numbers of birds were involved and they passed through quite quickly. At Dawlish Warren, also on the south coast of Devon, the first peak on 2 May coincided with the first peak in the Severn, and although the second peak was reached much later (28 May), no counts were made during the critical period between the 9 and 21 May. However, it is clear that birds remained for much longer in this area. These birds appeared to be less well advanced in terms of plumage development than those at most other sites in the west. The other information collected on plumage development suggests that many Sanderlings undergo a significant proportion of their prenuptial moult in western Britain. No counts were made at Kenfig Sands after 4 May, but the numbers there in April were quite different from those recorded at all the other sites in Figs. 1 and 2.

The situation on the east coast of Britain (Fig. 3) was rather different from that in the west, with peak passage occurring much earlier. At Sandwich & Pegwell Bays the maximum number of Sanderlings was recorded on 14 April and the passage was relatively prolonged, with signs of secondary peaks on 2 May, 13 May, 20 May and 2 June. Some of these secondary peaks coincided with arrivals in the west, (note the apparent departure of birds in full nuptial plumage between 20 and 22 May) but they could equally well have been independent waves of migrants heading for quite different breeding areas. On the whole the proportion of birds in full nuptial plumage remained rather lower than at sites in the west. The peak date was very similar on the Wash (13 April), while Teesmouth had two peaks (18 April and 9 May). In the Firth of Forth, there was an extraordinary early maximum on 1 April, followed by a second peak on 29 April. Whilst the first peak appears to be missing from other sites, a closer look at those which were counted early enough in the survey period, indicates a possibility that something similar may have occurred at the Wash, Sandwich & Pegwell Bays, and the Ribble.

Certain broad trends are detectable in these counts which can be summarised as follows. Firstly there is some evidence of passage right at the beginning of the survey period. In the west there generally appear to be two subsequent peaks of passage, one right at the beginning of May and one in mid May which occurs later at sites further north. In the south-east the main peak occurs in mid April and is rather more extended than in the west. In the north-east the situation is more complicated with some passage of birds occurring later than in the south-east. These are only the broad trends and there are some sites, such as Kenfig, which show an apparently exceptional pattern.

Although rather few catches of Sanderlings were made (Table 1) they do shed a little light on the situation - despite the fact that birds breeding in different regions of the arctic are morphologically so similar (Prater et al. 1977). It is helpful first of all to outline the situation on the Wash (based on Minton 1975) where Sanderlings have been caught regularly over the course of many years. One group of birds, for which there is slight evidence that they may be of Nearctic origin (i.e. breeding in Greenland and possibly small parts of the eastern Canadian archipelago), pass through the Wash in late July and early August, putting on a considerable amount of fat before departing to wintering areas in south and west Africa. These birds are believed to pass mainly up the west coast of Britain during the spring migration since there are few retraps of Sanderlings in this category in the spring (the analysis of Wash retraps, controls and measurements currently being undertaken at the University of Dundee should help clarify this situation). An apparently different category of birds also occurs in the Wash in autumn, which do not gain weight immediately, but instead undergo the postnuptial moult there. Some move off later to wintering areas probably in Europe and north Africa, whilst the rest winter on the Wash and leave in April and May for Palaearctic breeding areas. Juveniles of the latter group moult into summer plumage in May and depart northwards rather later than the adults. The earliest 1979 catch on the Wash (Table 1) on 28 April consisted of birds with an average adult bill length of 25.3 mm. A later catch on 26 May had an identical mean bill length but was on average 24% heavier (adults only). It has been suggested that the bill lengths of Siberian birds (most of the Wash birds should have been of easterly origin) are about a millimetre longer than those from other areas (Prater et al. 1977). The average figure tentatively suggested by these authors is about 25.6 mm, which is very close to that of the Wash samples.

The only other moderately large sample of Sanderlings whose bills were measured in spring 1979 was captured at Southport on 27 May. These birds were almost exclusively adults and had an approximately equal sex ratio. The average bill length of both sexes combined was 23.9 mm which is over a millimetre shorter than the Wash samples and suggests that they were of Nearctic origin. Their wing lengths were also a trifle shorter, but in view of the possible errors of measurement, this is not of any great significance. The bill lengths of the Southport birds were actually rather shorter than those of small samples from the southern part of the breeding range in east Greenland (6 males - 23.9 mm; 5 females - 25.8 mm; 21 adults, including sexed and unsexed individuals - 24.9 mm) (Green 1978b). Samples from the northern part of the range in east Greenland do have shorter bills however (7 males - 22.8 mm; 11 females - 25.1 mm) (Manniche 1910, Johnsen 1953). There thus appears to be a slight decrease in bill size from the south to the north of Greenland, and the Southport birds might have been a mixture of birds from different breeding areas in the whole of this region. The standard deviations of the bill lengths of the spring migrants were certainly larger than those of the breeding adults and this seems to be a general phenomenon amongst migrant waders reflecting the diverse geographic

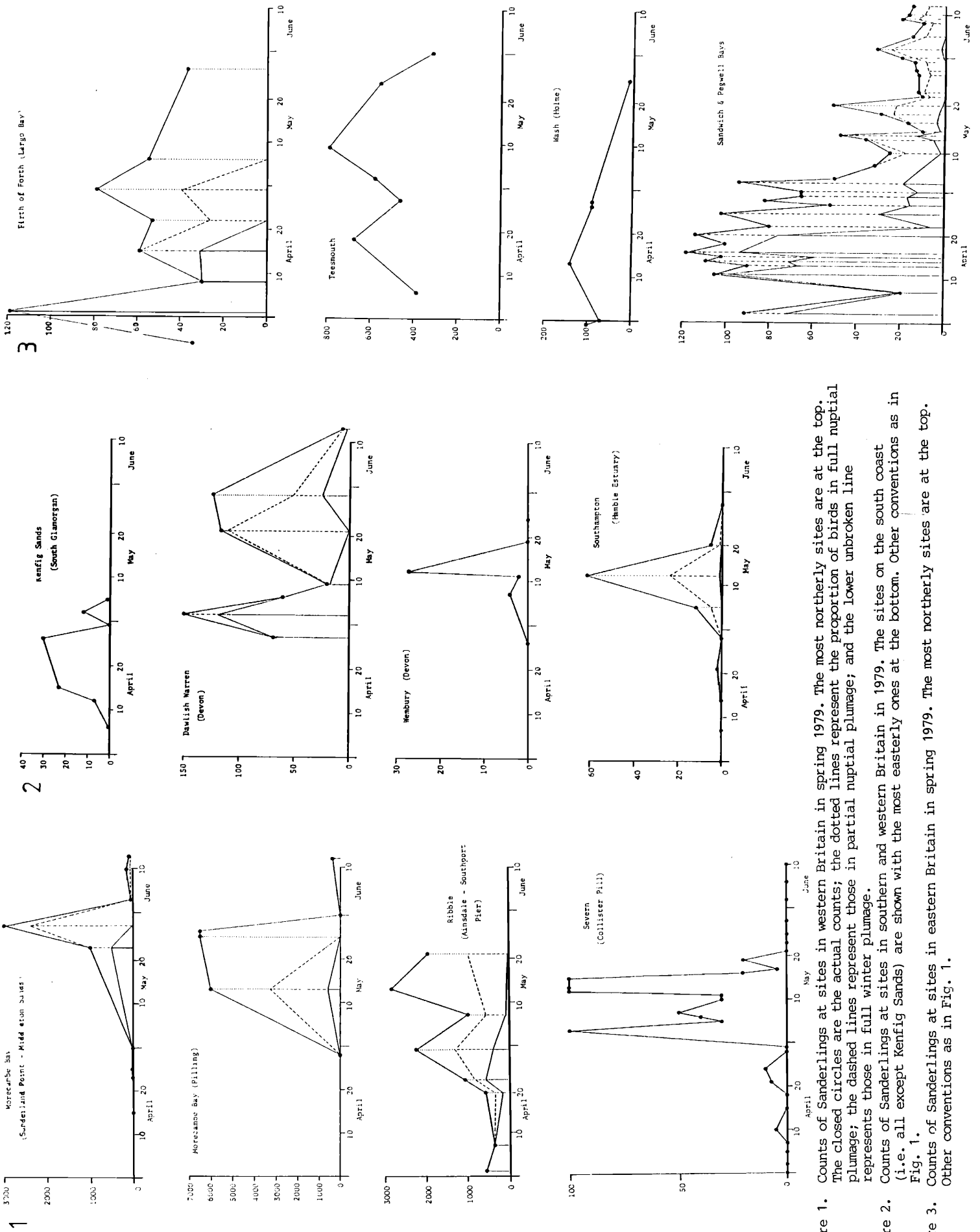


Figure 1. Counts of Sanderlings at sites in western Britain in spring 1979. The most northerly sites are at the top. The closed circles are the actual counts; the dotted lines represent the proportion of birds in full nuptial plumage; the dashed lines represent those in partial nuptial plumage; and the lower unbroken line represents those in full winter plumage.

Figure 2. Counts of Sanderlings at sites in southern and western Britain in 1979. The sites on the south coast (i.e. all except Kenfig Sands) are shown with the most easterly ones at the bottom. Other conventions as in Fig. 1.

Figure 3. Counts of Sanderlings at sites in eastern Britain in spring 1979. The most northerly sites are at the top. Other conventions as in Fig. 1.

origins of such birds. It must be emphasized, however, that these differences in bill length are very small and no firm conclusions should be reached on them alone.

The majority of British wintering Sanderlings are thought to be of easterly origin (Prater & Davies 1978). Ringing recoveries are not very helpful in determining the origins of west coast spring migrants since although a bird captured on 14 May 1972 in Iceland (and therefore presumably en route to the Nearctic since no Sanderlings breed in Iceland) was controlled on the Dee on 11 May 1975, another bird caught on the Dee on 16 May 1972 was controlled in Murmansk (U.S.S.R.) on 16 July 1974 (Spencer & Hudson 1976, 1977). However, exchanges of ringed birds between the west coast of Britain in spring, and sites as far as Scandinavia in autumn, are probably not of any great help in determining breeding origins, since the autumn migration is quite well dispersed compared with the more purposeful spring passage. Even if birds of easterly origin do form a component of the west coast spring passage, it seems likely that the majority are heading for the Nearctic.

Since the breeding range of Sanderlings which migrate northwards through Britain in the spring is probably more extensive in the east than the west, thus including areas which are likely to differ a great deal in the optimal timing of the breeding season, it is not surprising that the spring passage on the Wash and at Sandwich & Pegwell Bays was more extended than in the west. It may take place earlier because some birds have further to go and perhaps may stop off at other intermediate feeding areas. This may also explain why fewer birds were in full nuptial at the latter site. Only a few Nearctic Sanderlings are thought to stop off at Iceland, most of them probably reaching the breeding grounds in one step after leaving Britain (Morrison & Wilson 1972).

The very early wave of migration detected in the Firth of Forth, and possibly elsewhere, is particularly fascinating. Counts should really have been commenced at the beginning of March in order to examine this properly. Prater & Davies (1978) argue that the scale of any return migration of Sanderlings to Britain before May is small because the average March count for the whole of the country between 1971/72 and 1874/75 was less than 5% higher than the average February count. The April count was similarly only 10% greater than the March count (the May count was several hundred percent higher than the April count). However, unless there is an error in the national totals given in Prater (1974, 1975, 1976, 1977), I calculate these percentage increases to be 35% between February and March, and 6% between March and April. 1974 was notable for a particularly large increase in the March counts. Since the counting errors are believed to be in the region of 10-20%, the influx of birds into Britain in March seems to be a real one. In the light of this, the sighting of a Greenland colour-ringed Sanderling in Co. Mayo, Ireland on 9 March 1975 (Green 1978a) and the recovery of an Icelandic ringed bird at Holy Island on 20 March 1975 (Spencer & Hudson 1975), previously taken as surprising evidence that Nearctic Sanderlings might after all winter in Britain, no longer seem so remarkable. It appears quite possible that at least a few spring migrants arrive in Britain far in advance of the main May passage.

The overall pattern of the main mass of Sanderling migration is in some ways similar to that of the Ringed Plover *Charadrius hiaticula*, with two concentrated waves of passage in the west and one prolonged wave in the south-east. The explanation of the two waves in the west remains a complete mystery. Since the breeding range in the Nearctic includes a more or less continuous spectrum of different snow-melting dates (even in the southern part of the range there is a wide spread of such dates (Green et al. 1977)), it does not seem very plausible that birds from different breeding regions are involved. Measurements of birds from the two phases of migration, say on the Ribble, could help in determining if this is the case - provided of course that two waves are a regular feature of Sanderling migration and not just a peculiarity of the 1979 season. Any birds which might be going to stop off in Iceland should have lower departure weights than those which fly direct to the breeding grounds.

Assuming a fat free weight of 51g (Green 1978c) and using the method of McNeil & Cadieux (1972) the theoretical flight range of the adult Sanderlings captured on the Wash on 26 May and at Southport on 27 May was about 1800 miles. Such a flight range would enable them to reach well up the coast of N.E. Greenland and the White Sea respectively. The sample of very heavy birds from Teesmouth on 23/28 May must have been close to their true departure weights (the mean weight of the heaviest sample ever captured during spring passage on the Wash was less than 80g (MacGregor & Jones 1979)). These birds had a theoretical flight range of about 2,300 miles which could have taken them as far as Ellesmere Island in the west or the Kara Sea in the east.

The only significant departures noted during the course of the project were two flocks, both of about 100 birds which left Aberlady Bay in the Firth of Forth at 1240 hrs. on 1 June at great height on a heading of 315° (true). This bearing, if maintained, would take them towards the southern coast of Iceland. This is a very strong indication that at least some of the Firth of Forth birds were of Nearctic origin. Although no Sanderling departures were observed from the Severn Estuary in 1979, small numbers recorded over several years have always headed in approximately the same direction (342° true) which would take them directly towards Iceland (passing over the Irish Sea on the way).

The results of the Spring Passage Project have raised many more questions about Sanderling migration than they have answered, but they do suggest one or two profitable lines for further investigation. Firstly, a systematic review is badly needed of the material in museums, and of published measurements to establish the morphological differences (including bill lengths) between birds from different breeding areas. Secondly, the consistency, or otherwise, in the bill lengths of samples of birds captured in Britain, both at the same site and at different sites, needs to be established. Only then will it be possible to determine if small differences in size can be of any value in indicating probable breeding areas. There should already be a good supply of suitable raw material for investigating the latter in the Wader Study Group files. Thirdly, more information should be collected on the direction of departure of birds in spring. Although this may be difficult to obtain, it is of greatest value in determining their probable destinations.

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TABLE 1. SUMMARY OF SANDERLING CATCHES OBTAINED DURING THE SPRING PASSAGE PROJECT

Site	Date	Number, age & sex	Wing length (mean \pm S.D. in mm)	Bill length (mean \pm S.D. in mm)	Weight (mean \pm S.D. in g)	Nuptial plumage (mean \pm S.D. in %)
Solway Firth (Waterfoot Annan)	120579	2 adults	129.0	27.6	58.5	35.0
	130579	2 adult males	129.0	25.3	51.1	60.0
		2 adult females	131.5	26.2	52.4	55.0
Teessmouth	080379	18 adults	-	-	54.9 \pm 3.3	
		10 juveniles (64% adults, 36% juveniles)	-	-	57.7 \pm 3.7	
	230579	23 adults	-	-	83.1 \pm 9.3	
	280579	2 juveniles (92% adults, 8% juveniles)	-	-	73.0	
		5 age unknown	-	-	76.4	
Morecambe Bay (Hest Bank)	200579	76 adults	127.0 \pm 2.6	-	58.5 \pm 5.5	
Southport (Marshside)	270579	42 adult males	127.0 \pm 2.6	23.3 \pm 1.1	74.8 \pm 8.4	
		49 adult females (46.2% males, 53.8% females)	128.9 \pm 3.3	24.4 \pm 1.8	72.7 \pm 11.7	
	5 unsexed adults	127.2	22.7	75.7		
	2 Juvenile males (98.0% adults, 2.0% juveniles)	122.5	22.5	72.0		
Wash (Holme)	280479	35 adults	129.9 \pm 3.0	25.3 \pm 1.3	60.1 \pm 4.2	29.1 \pm 15.2
		4 juveniles (90% adults, 10% juveniles)	129.5	26.2	60.8	12.8
(Heacham)	260579	19 adults	128.2 \pm 2.8	25.3 \pm 1.8	74.4 \pm 8.2	44.6 \pm 19.9
		65 age unknown	128.0 \pm 3.0	25.2 \pm 1.4	65.9 \pm 8.6	34.2 \pm 15.2
Devon (Wembury)	120579	3 adults	125.3	23.8	50.4	33.3

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Dr. P.N. Ferns, Zoology Department, University College, Cardiff, Wales, GB.