Pectoral Sandpipers in Europe:

vagrancy patterns and the influx of 2003

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ABSTRACT Unprecedented numbers of Pectoral Sandpipers *Calidris melanotos* were reported in Britain & Ireland during autumn 2003, and to a lesser extent throughout the rest of Europe as well. This paper presents a review of the occurrence patterns and migratory behaviour of the species, both during the 2003 influx in Europe, and on a wider scale. Potential explanations for the unexpected regularity of this species in Europe, given its relatively small global population size and predominantly overland migration strategy, are discussed. It is suggested that the routes and wintering grounds used by Pectoral Sandpipers are more dynamic than was previously acknowledged.

The autumn of 2003 produced the largest influx of Pectoral Sandpipers *Calidris melanotos* ever recorded in Britain & Ireland, with at least 261 birds reported (figs. 1 & 2; data compiled from reports at www.birdguides.com). Although these are unchecked reports, which have not been assessed by county or local records committees, the overall pattern they show of the influx is likely to be broadly accurate. By comparison, the previous highest annual totals were of 132 records in 1999, 131 in 1984 and 91 in 2000 (Peter Fraser *in litt.*); note that these totals refer to accepted records only, and exclude Irish

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records. Mean annual totals of Pectoral Sandpipers recorded in Britain in the last three decades are 40 during 1968-79, 70 during 1980-89 and 57 during 1990-99 (Fraser & Rogers 2003). These numbers serve to underline the species' status as the most frequent Nearctic vagrant to Europe (Hayman *et al.* 1986; Lewington *et al.* 1991). Interestingly, it is far from the commonest migratory wader in North America. A recent estimate put the world population at 400,000 individuals – comparable with that of White-rumped Sandpiper *C. fuscicollis*, but a fraction of the estimated 3.5 million Semipalmated Sandpipers *C. pusilla*, for example (Morrison *et al.* 2001). In these terms, the relatively high frequency with which Pectoral Sandpipers occur in Europe is quite surprising. In this paper, we attempt to evaluate the potential factors which may be responsible for this species' predisposition to vagrancy. In particular, we investigate the species' occurrence pattern in Britain and Europe, before relating this to what is known about its migration strategies in the rest of the world.

Pectoral Sandpiper has an extensive breeding range, stretching from Hudson Bay westwards across the North American tundra and into Siberia, where it breeds west to the Yamal Peninsula, immediately to the east of the Ural mountains (Snow & Perrins 1998; Zockler & Lysenko 2000). Since the 1980s, breeding has also been suspected within the boundary of the Western Palearctic, in European Russia, suggesting a more extensive breeding range than was previously thought (Hagemeijer & Blair 1997). The bulk of the population winters in southern South America, from southern Bolivia, Paraguay and northern Argentina to southern Argentina (del Hoyo *et al.* 1996). Small numbers also reach southeast Australia, Tasmania and New Zealand, these presumably being of Siberian origin, migrating down the western Pacific fringe. Small wintering populations have also been recorded on islands in the central Pacific, including Hawaii and the Phoenix group (Hayman *et al.* 1986). Vagrants have occurred widely, reaching Africa, the Middle East, India and east Asia, reinforcing the status of this species as a truly global wanderer (Hayman *et al.* 1986; Urban *et al.* 1986; Shirihai 1996; Eguchi *et al.* 2000; Carey *et al.* 2001; Undeland & Sangha 2002).

Pectoral Sandpipers in Britain & Ireland and Europe

In autumn, records of Pectoral Sandpipers in Britain & Ireland tend to follow a clear temporal and regional pattern. During July and August, there is an eastern bias to the distribution of new arrivals (predominantly adults), while in September and October, the picture is of a broader geographical spread, with generally higher numbers of birds and a preponderance of juveniles. In 2003, the overall pattern of records was broadly typical. After the first record, at Maer Lake, Cornwall, on 2nd July, the passage of adults showed a small peak from approximately 15th to 25th July (fig. 1). Although there were some exceptions, including several Irish records, the spatial pattern of these early migrants showed a distinct easterly bias (fig. 2a). The bulk of records in 2003 occurred in September, however, with a clear peak between 2nd and 22nd. The majority of these

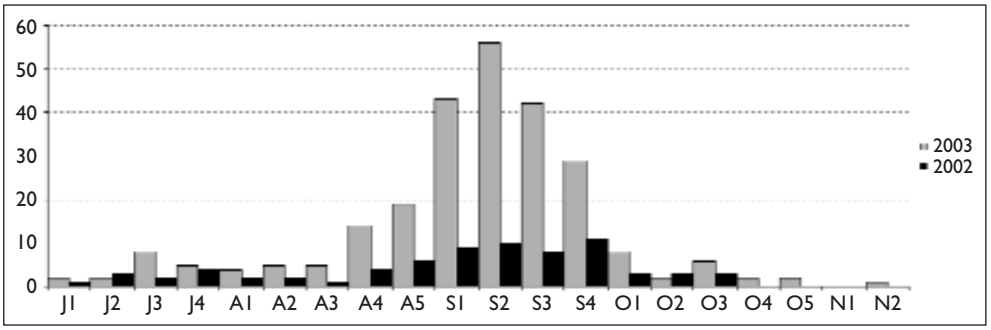

Fig. 1. Comparison of the number of Pectoral Sandpipers *Calidris melanotos* reaching Britain & Ireland each week during the autumns of 2002 and 2003. The weekly totals (seven-day periods from 1st July, so that J1 = 1st-7th July, J2 = 8th-14th July, J3 = 15th-21st July, J4 = 22nd-28th July, A1 = 29th July to 4th August, etc.) represent all new arrivals, although there is likely to be some duplication as a result of individuals moving between sites. Data are unchecked reports derived from BirdGuides (www.birdguides.com) and have not been assessed by county or local records committees.

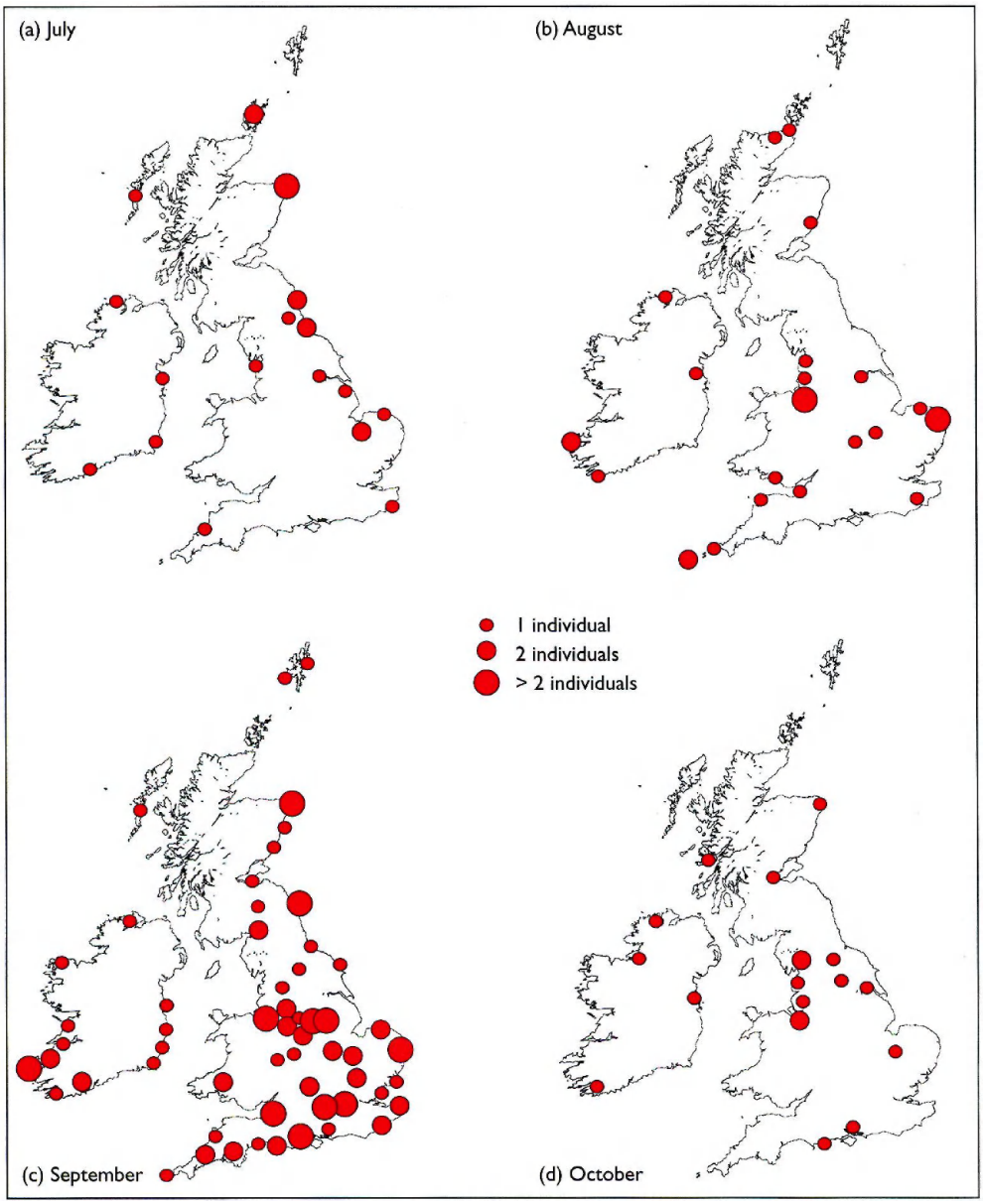

Fig. 2. Distribution of Pectoral Sandpipers *Calidris melanotos* in Britain & Ireland in autumn 2003. Dots represent new arrivals only in each month. Data are unchecked reports derived from BirdGuides (www.birdguides.com) and have not been assessed by county or local records committees.

were juveniles, and fig. 2c reveals a much wider geographical spread, suggesting a broad-front movement across Britain during this period. New arrivals tailed off quickly in October, with records concentrated in western parts of Britain, and Ireland (fig. 2d). Consequently, the temporal and spatial patterns of the influx in 2003 were familiar; it was the magnitude of the influx which was notable.

Many other countries in Europe also reported record numbers of Pectoral Sandpipers in the autumn of 2003, although the numbers involved were considerably smaller than those in Britain & Ireland. A clear temporal pattern was again evident, with birds arriving in northern Europe from the third week in July, and slowly filtering down into central and southern Europe as the autumn

progressed (fig. 3). This general pattern fits the known migratory strategy of Pectoral Sandpiper, with overland movements in autumn being made slowly via short hops (Piersma 1987; Farmer & Wiens 1999). Given the abundance of suitable habitat in continental Europe, the actual number of birds involved in autumn 2003 was likely to have been much higher than the data suggest.

Unusually large displacements of migrants are most likely to occur as a result either of exceptional weather conditions, or of a sharp increase in population levels following a particularly successful breeding season (e.g. Moss 1995, Veit 1997). The influx of Pectoral Sandpipers in Britain & Ireland in 2003 was spread over an extended time period, with large numbers being discovered almost daily throughout September (fig. 1). Various weather systems were prevalent over Europe during this period, suggesting that no single weather pattern could account for the influx. Fig. 1 also presents a comparison of numbers in 2003 with those of a more 'normal' year (2002). This shows that passage in July and early August, involving mainly adult birds, was of a similar magnitude in both years. The main difference between 2002 and 2003 was the higher number of juveniles which arrived in late August and throughout September. By early October 2003, the number of new arrivals was greatly diminished, and numbers were again comparable with those in 2002. This suggests that Pectoral Sandpipers enjoyed a successful breeding season, combined with high levels of juvenile survival and recruitment within the source area of European vagrants. The proximate mechanism by which these birds arrived in Europe is, however, more open to debate.

Like most Nearctic vagrants, Pectoral Sandpipers are generally believed to arrive on the eastern side of the Atlantic as a result of winddrift (Nisbet 1959; Moss 1995; Cottridge & Vinicombe 1996), or perhaps even in the jet stream (Elkins 1988). This explanation holds well for those which turn up in September and October, when regular Atlantic depressions inevitably drag many inexperienced individuals (mostly juveniles) off course. The passage of adults in early autumn is, however, more difficult to explain. The more experienced adults are thought less likely to be affected by winddrift (Moss 1995), while fast-moving depressions are unusual during July and August.

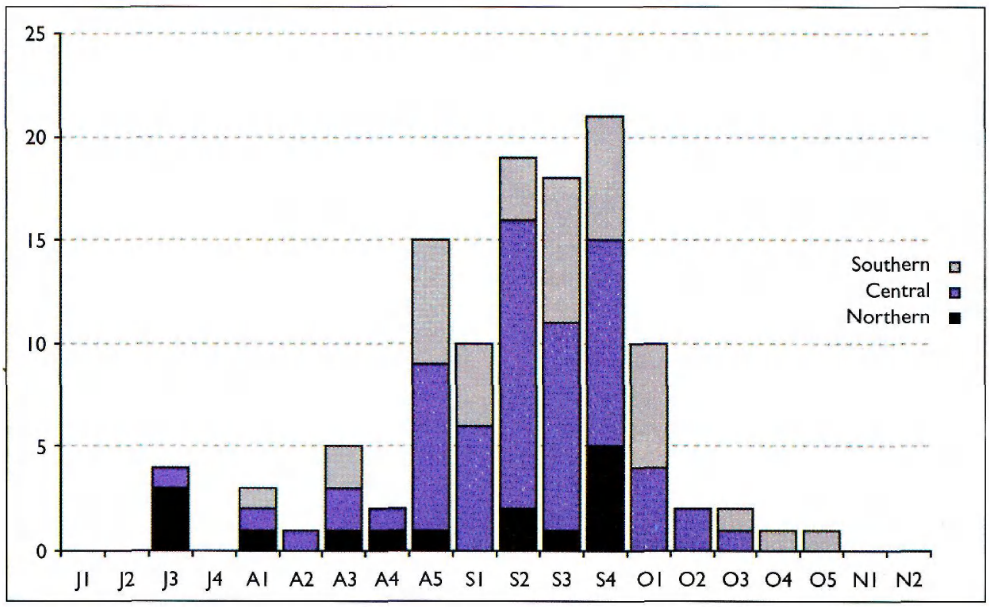

Fig. 3. Temporal distribution of Pectoral Sandpiper *Calidris melanotos* records in Europe (excluding Britain & Ireland) in autumn 2003. Countries are grouped regionally (values in parentheses indicate number of records). Southern Europe includes Switzerland (5), Italy (7) and Spain (26); Central Europe includes Poland (6), Germany (14), France (30) and Hungary (11); Northern Europe includes Iceland (4), Norway (7) and Finland (4). Many records are still awaiting acceptance by national records committees. Data presented in seven-day periods from 1st July, so that J1 = 1st-7th July, J2 = 8th-14th July, etc.

Alex Lees

371. Pectoral Sandpiper *Calidris melanotos*, Seal Island, Nova Scotia, Canada, 18th October 2002. These late migrants may be Siberian breeders on a Great Circle route to South America (Hayman *et al.* 1986), staging in Atlantic Canada before embarking on a direct sea crossing to South America.

Other authors have proposed alternative causes for the appearance of adults in early autumn. Sharrock (1971) postulated that the summer adults could be re-orientating individuals that crossed the Atlantic in the previous autumn and spent the summer in northern Europe. Both Lewington *et al.* (1991) and Toms (2002) suggested that a proportion of adult Pectoral Sandpipers reaching Britain in early autumn may originate from Siberian breeding grounds. Given that their arrival frequently coincides with the appearance of adult Little Stints *C. minuta* and Curlew Sandpipers *C. ferruginea* along the North Sea coast, species which share breeding grounds with Pectoral Sandpipers in western Arctic Siberia, this would seem to be the most likely origin. When considering the similar pattern of occurrence found in White-rumped Sandpipers, Cottridge & Vinicombe (1996) suggested that adults migrate with flocks of waders, such as Ringed Plovers *Charadrius hiaticula* and Dunlins *Calidris alpina*, heading south from their breeding grounds in Greenland, and that these commoner species then act as carriers.

So far, these hypotheses have been raised only in speculation, and the occurrence pattern of Pectoral Sandpipers has not been discussed in detail. In the remainder of this paper, we will attempt to explore this pattern more fully, particularly through a discussion of the 'normal' migration strategy for this species.

Pectoral Sandpiper migration strategy

The migratory routes of Pectoral Sandpipers in North America are relatively well understood, and present an interesting paradox in relation to the pattern of occurrence in Europe. The species has been classified as a 'narrow-band migrant', with 90% of the population migrating south along a relatively narrow corridor through interior North America (Skagen *et al.* 1999). Birds do not tend to concentrate at particular spots en route but rather make use of several feeding stops punctuated by short migratory hops (Piersma 1987; Farmer & Wiens 1999). A smaller proportion follow a coastal route along the eastern seaboard of North America. Most of these use staging grounds along the coasts of eastern Canada and north-east USA, prior to a direct crossing of the western North Atlantic to South America (Cramp & Simmons 1983; Lewington *et al.* 1991). This latter route – the most likely source of wind-drifted European vagrants – is, therefore, a secondary route, followed by a small fraction of the overall population.

The fact that the Pectoral Sandpipers migrate primarily through interior North America is borne out by the relatively low numbers of this species at eastern seaboard localities (Godfrey 1966). A long-term study by McLaren (1981) on Sable Island, off Nova Scotia, found Pectoral Sandpiper to be only the twelfth-commonest wader during the period 1967-79. A total of just 227 individuals was noted over this period, compared with 1,927 White-rumped Sandpipers and 1,415 American Golden Plovers *Pluvialis dominica*. Given the location of this island, some 180 km east of the Nova Scotia coastline (and on a potential flight line between Nearctic wader staging grounds and western Europe), one might expect the numbers of migrant waders to occur in similar proportion to those reaching Europe. Evidently this is not the case and, if wind-drift is indeed the principal cause of transatlantic vagrancy, the regularity of Pectoral Sandpipers in Europe becomes even more surprising.

The migratory strategy of Pectoral Sandpipers from the Siberian breeding population

adds a further twist to the story. The breeding range of Pectoral Sandpiper in Siberia is almost as extensive as that in North America, suggesting that a surprisingly high proportion of the world population may breed in the Old World (Hayman *et al.* 1986; Hagemeijer & Blair 1997). This population apparently uses the same South American wintering grounds as the Nearctic population, since there have been recoveries in Siberia of birds ringed in Saskatchewan and Kansas during autumn migration, which also explains the fact that juvenile Pectoral Sandpipers are unexpectedly late migrants through North America (Cramp & Simmons 1983; Paulson 1993; Toms 2002). Siberian breeders must, therefore, migrate north and east from their breeding grounds in autumn, across the Arctic Ocean to northern Canada, before joining the 'normal' route through North America. Some are thought to use the North American Pacific coast as a flyway, but the majority are believed to follow the same routes as North American breeders (Paulson 1993). This route takes Siberian breeders on a staggering 16,000-km odyssey, navigating across three continents, to their wintering grounds (Cramp & Simmons 1983). Wind-drift is unlikely to carry the individuals using this route towards Europe, although the difficulty of using magnetic navigation cues at high latitudes might predispose Siberian breeders to vagrancy (Alerstam & Gudmundsson 1999).

The pattern of occurrence of Pectoral Sandpipers in Europe poses several conundrums. How can a species with a relatively small population size and a predominantly overland migration route through the American midwest become the most frequently occurring Nearctic vagrant in Europe? Why do so many adults reach Britain & Ireland in early autumn, especially during periods when weather-related drift is unlikely? Why is there a North Sea coast bias to these early autumn records? Why do Pectoral Sandpipers farther east in Europe tend to occur in spring? None of the hypotheses mentioned so far can fully account for these patterns. Potentially, a more satisfactory explanation comes from the theory of pseudo-vagrancy, i.e. that many of the Pectoral Sandpipers reaching Europe are actually performing a regular and viable migration to established wintering grounds in the Old World (e.g. Gilroy & Lees 2003).

David Tipling/Windrush

372. Juvenile Pectoral Sandpiper *Calidris melanotos*, Bough Beech Reservoir, Kent, September 2003. Present from 12th to 17th September, this individual was one of many juveniles that contributed to the extraordinary peak of records in early to mid September 2003 (see fig. 1, p.639).

An American pseudo-vagrant?

Many authors have suggested that a proportion of wind-drifted Pectoral Sandpipers could successfully overwinter on the 'wrong' side of the Atlantic (e.g. Urban *et al.* 1986, Lewington *et al.* 1991, Toms 2002). Alerstam (1993) noted that Pectoral Sandpipers are often encountered in circumstances which 'suggest normal migration through Europe'. The large number of records, the relatively high frequency of adults, and the small but predictable spring passage are all indicative of the existence of a small population moving through western Europe on an annual basis. The consistency of arrivals between years is perhaps also a strong indicator of a regular migration. Pectoral Sandpipers are capable of making extremely long migratory journeys, including major sea crossings, and are not particularly specific in their habitat requirements (Hayman *et al.* 1986). It is not inconceivable that suitable wintering habitat in the Old World could be successfully utilised by vagrant individuals. Could Europe even be part of a migratory flyway for this species?

As noted earlier, the normal winter range of Pectoral Sandpiper lies predominantly in southern South America. Observer coverage at similar latitudes in Africa is extremely low, which is a perennial problem when trying to detect small, sparsely distributed wintering populations (Gilroy & Lees 2003). Nonetheless, a surprising number of records do exist in this region. For example, Sinclair *et al.* (1993) described Pectoral Sandpiper as a 'rare but regular (austral) summer visitor' to southern Africa. Typically, these individuals arrive in early December, some two months later than the mean arrival period to this region of vagrant Baird's Sandpipers *C. bairdii*, for which storm-drift during normal migration is a more likely cause of vagrancy (Borrow & Demey 2001). Elsewhere, there are also records of Pectoral Sandpipers from several sub-Saharan West African nations, including Mauritania, Senegal, Sierra Leone, Liberia, the Ivory Coast, Ghana, Gabon and Príncipe, between October and March (Borrow & Demey 2001). Furthermore, vagrants have also occurred in East Africa, with at least two records from Kenya and one from Burundi (Stevenson & Fanshawe 2002). It seems that there is great potential for a small but viable wintering population of Pectoral Sandpipers to exist in these areas.

Taking this hypothesis one step further, it is not implausible that a discrete population could use Europe as a regular migratory flyway to wintering grounds somewhere in Africa. Perhaps the most likely origin for such a 'pseudo-vagrant population' of Pectoral Sandpipers would be Siberia (fig. 4). For those individuals breeding at the western extreme of the Siberian breeding range, it might be expected that a shorter, and largely overland, route to suitable Old World wintering areas would enhance the chance of surviving an otherwise arduous migration to southern South America. It would seem that those capable of finding suitable wintering areas in the Old World, surviving the winter, and successfully returning to breed would be at an advantage over those travelling to South America (Mead 1983; Sutherland 1998). Presumably, the small wintering population in Australasia represents a proportion of Siberian breeders using an alternative migratory route through Asia. In terms of overall distance and the availability of potential staging areas, a route to Africa via western Europe might perhaps be similarly viable.

In Britain & Ireland, Pectoral Sandpipers are considerably scarcer in spring than in autumn. This is to be expected considering: a) the urgency of spring passage; b) the effect of winter mortality; and c) the potential differences in observer behaviour (with less attention paid to island archipelagos and wader hotspots). There is, however, evidence of a spring bias to records in central and eastern Europe,

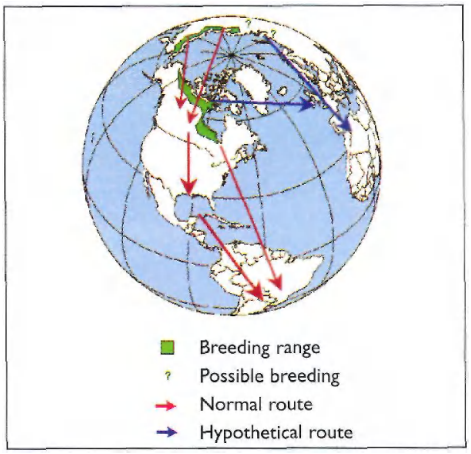

Fig. 4. Global projection map showing the breeding range and normal migratory route of Pectoral Sandpipers *Calidris melanotos*. The hypothetical routes (blue) show potential migration strategies which could be used by small populations wintering in southern or western Africa.

Bill Baston

373. Juvenile Pectoral Sandpiper *Calidris melanotos*, Bawdsey, Suffolk, September 2003.

which suggests that northbound spring migrants might use a different, more easterly, route than in autumn (in North America, the main movement of Pectoral Sandpipers in spring follows a more westerly route than in autumn; Farmer & Wiens 1999). In both The Netherlands and Denmark, for example, spring and autumn records of Pectoral Sandpiper occur with approximately similar frequency (van den Berg & Bosman 1999), while in Finland Pectoral Sandpiper is predominantly a spring vagrant (Lewington *et al.* 1991). Nonetheless, there is at least some degree of spring passage through Britain & Ireland and, following the bumper autumn in 2003, this involved at least 41 birds between 11th April and 14th June 2004. Thus, until a clearer picture emerges, it is assumed that return passage also occurs on a broad front through western Europe.

The annual influx of Pectoral Sandpipers into Europe may, therefore, consist of transatlantic vagrants caught up in severe weather systems, and also birds from both North America and Siberia which have developed an alternative migratory strategy, and now overwinter in Africa. Shorebird migration routes are dynamic, and different populations are apt to establish new migration routes and wintering grounds if traditional routes become suboptimal. While the bulk of the population of Pectoral Sandpipers (including many of the Siberian breeders) move south along a narrow overland route through the USA to South America, there may exist perhaps as many as six secondary routes to suitable wintering areas. These are, in approximate order of likelihood:

1. American and Siberian birds moving east towards staging areas in northeast USA and the Atlantic shoreline of Canada, and then south on a transoceanic route across the Caribbean into South America;
2. American (and more likely Siberian) birds moving south along the Pacific seaboard of the USA;
3. Siberian (and American?) birds moving across the Pacific to winter on island groups in the central Pacific, predominantly Polynesia and Hawaii;
4. Siberian birds moving south along the Asian Pacific seaboard to winter in southeast Australia and New Zealand;
5. Siberian birds moving west and south, via Europe, to winter in Africa;
6. American birds migrating across the Atlantic, via western Europe, to winter in Africa.

The identification of such routes and wintering grounds is undoubtedly a worthwhile exercise. Although the magnitude of passage along many of these routes may be small, they

may still be of biological importance. Habitat change on the wintering grounds has been a factor implicated in the population decline of various waders, including Buff-breasted Sandpiper *Tryngites subruficollis* and Slender-billed Curlew *Numenius tenuirostris* (BirdLife International 2000). Species which maintain small pseudo-vagrant populations in highly disparate wintering areas are likely to be less vulnerable to catastrophic changes in their main winter range. By exploiting a wide range of potential wintering grounds, Pectoral Sandpipers may have avoided the conservation equivalent of putting all their eggs in a single basket.

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