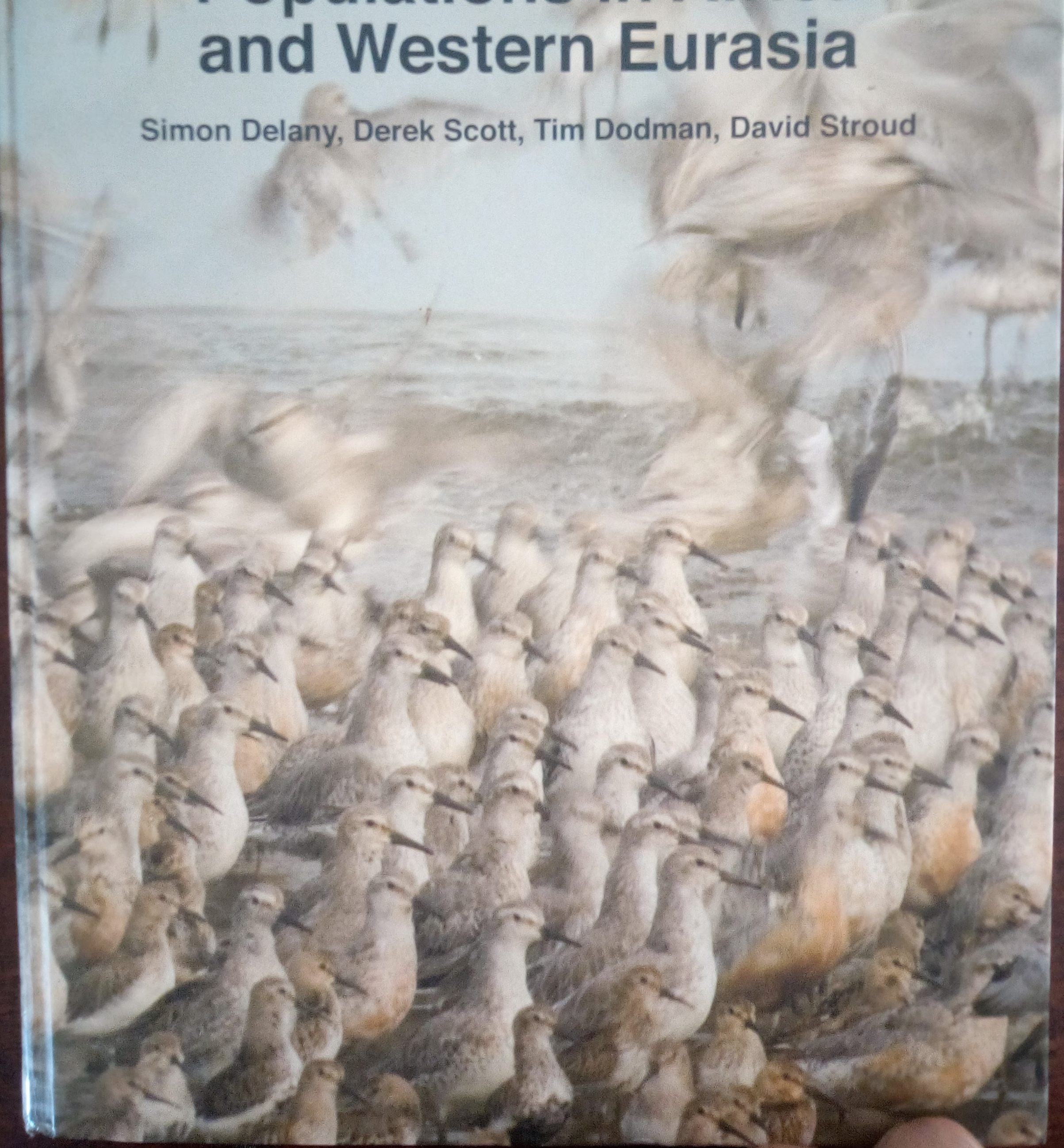
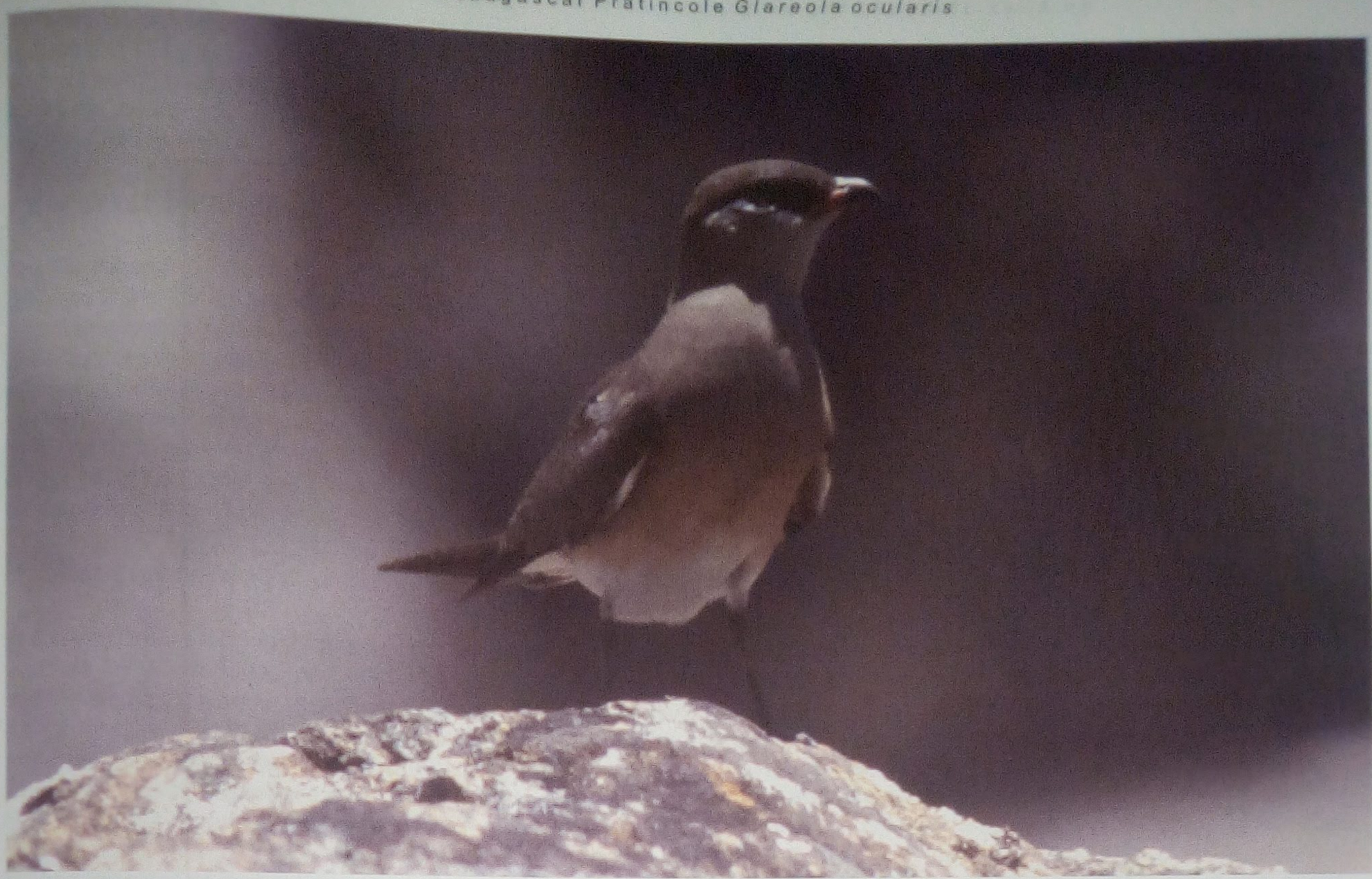
WETLANDS INTERNATIONAL

An Atlas of Wader Populations in Africa and Western Eurasia

Simon Delany, Derek Scott, Tim Dodman, David Stroud





Per Smitterberg

Madagascar Pratincole

Glareola ocularis

Geographical variation and distribution

The Madagascar Pratincole breeds solely in Madagascar, but is absent from the extreme south-west. It occurs widely in Madagascar, breeding mainly in the east, although a few colonies have recently been found in the west (Morris & Hawkins 1998). The limits of the non-breeding range are coastal Somalia to 3°N (Ash & Miskell 1998) in the north, the Zambezi Delta in Mozambique in the south, and, historically, Lake Victoria in the west. The whole population migrates to the East African coast, usually arriving in Tanzania and, to a lesser extent, Mozambique north of the Zambezi River, thence moving north to Kenya and southern Somalia, where it remains in a narrow coastal strip, largely west of the coastal sand dunes. There are occasional historical records from further west inland, including as far west as Lake Victoria

Movements

The species usually breeds in eastern Madagascar from November to January, then moves across the central highlands of Madagascar, assembling in large post-breeding groups on western rivers (Hawkins & Goodman 2003). It then migrates to its non-breeding range on the East African coast, where it is present from March to September (Urban *et al.* 1986). It probably enters and leaves Africa from western Madagascar via Tanzania, thence moving northwards along the coast, but there are also erratic records inland, usually involving 1-6 birds, although there are historical records of concentrations of hundreds at Lake Victoria (Urban *et al.* 1986). It tends not to remain in coastal areas of Tanzania, where it only occurs on passage; there is a record of 2,000 birds in April 1982, as well as several records from September (Baker & Baker 2005), presumably on southern migration. The earliest recorded arrival date of 25 May in southern Somalia is about two months later than arrival times in coastal Kenya, and it may be that the birds moult in coastal Kenya before moving on to Somalia (Ash & Miskell 1998). It has been recorded on passage in the Comoros, with records from Mayotte always in October (Louette 2004), representing birds returning to Madagascar to breed.

Population limits

Only one population is recognised, the entire population of the species.

Population size

1. Madagascar (breeding)

Population estimate	1% threshold	Population trend
5,000-10,000	75	Decrease

Langrand (1990) reported the species to be fairly common in Madagascar, although flocks there seldom exceed 150 birds. Large non-breeding congregations occur at two sites in western Madagascar, the Tsiribihina River and the Mangoky Delta (Lac Ihotry), with 250 birds recorded from each site, whilst a post-breeding flock of 121 has been seen in the east at the North Pangalanes wetlands (ZICOMA 1999). There are several significant counts from the 1970s and 1980s in the non-breeding range, but there are few recent high counts. There are records of flocks of 3,000 from southern Somalia from May 1979 and July 1981 (del Hoyo *et al.* 1986), whilst in Kenya, there is a report of 9,000-10,000 in 1978 (Lewis & Pomeroy 1989) and, more recently, a record of up to 2,500 at the Sabaki River mouth (Bennun & Njoroge 1999). In Tanzania, 2,000 were recorded at the Dar es Salaam coast in 1982 (Baker & Baker 2001). F. Hawkins (*in litt.* in Dodman 2002) has suggested that the total population may now be as low as 2,000-10,000 birds, and Fishpool & Evans (2001) gave an estimate of A (<10,000). In reviewing more recent data, Dodman (2002) suggested non-breeding totals of some 2,500-5,000 in Somalia, 2,500-5,000 in Kenya and <5,000

Madagascar Pratincole

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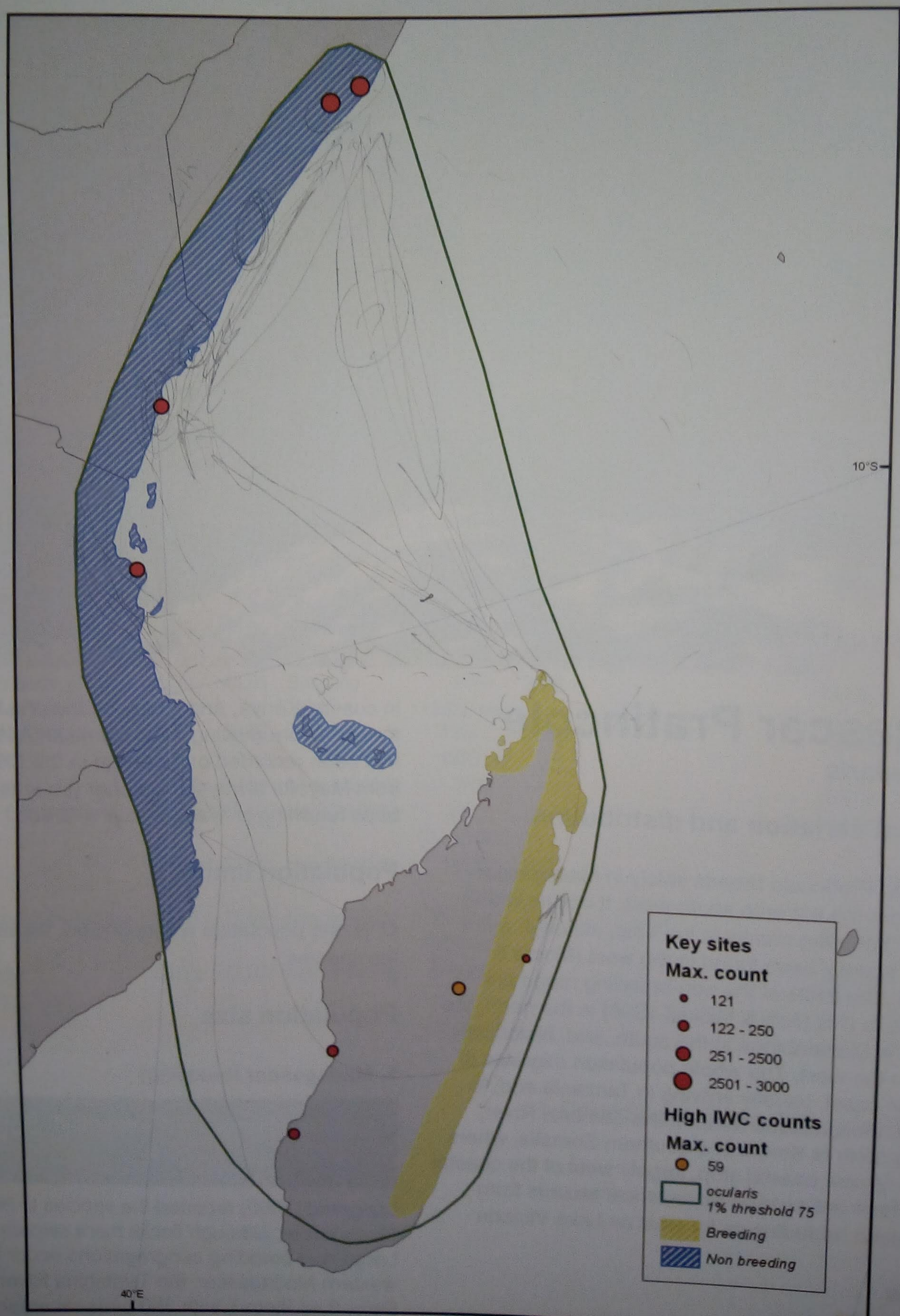


in Tanzania and Mozambique, and proposed a new estimate of 5,000-10,000 (considering that passage totals in Tanzania and northern Mozambique should not be added to the totals for Kenya and Somalia). This estimate was adopted in *WPE3* and retained in *WPE4*.

Conservation Status

The Madagascar Pratincole appears to have suffered major declines in the last 20 years, and may still be in decline. These declines are probably linked to the widespread loss and degradation of wetland habitats in Madagascar in recent years, but further investigation is required. In view of the species' small population size and declining trend, it was listed by BirdLife International (2004b) as Globally Threatened on the IUCN Red List in the category Vulnerable. Clearly it is a species which should be closely monitored.

Habitat and ecology

In Eastern Africa, it is highly gregarious, frequenting exposed mudflats and sand dunes, and edges of lakes and rivers, often hawking for insects at dusk, sometimes over woodland (Urban *et al.* 1986). In Somalia, it is locally abundant in inland wetlands, grasslands, bushland and other open areas, and along the Juba and Shebelle rivers (Ash & Miskell 1998). In Madagascar, it breeds in loose colonies on rocky islets in rivers, saltmarsh and coastal rocky areas, and is also found in short grasslands and at lake edges (Morris & Hawkins 1998). Nesting has been observed in November (Langrand 1990).

Network of key sites

In Madagascar, breeding sites mainly in the east of the country are of particular importance, although colonies are often quite small and their importance is cumulative. One key site identified in the east is the North Pangalanes wetlands, and two sites on the west coast also support significant numbers, the Tsiribihina River and Mangoky Delta (Lake Ihotry) (ZICOMA 1999).A colony of 40 to 70 individuals was found 30 km in north of Maevatanana, NW Madagascar, in November 2005 (Zefania, S. and T. Székely, *in litt.*).Key sites during migration include the Tsiribihina River and Lake Ihotry.

There are several key sites along the East African coast which probably hold very substantial proportions of the population at certain times of the year. In Tanzania, the Dar es Salaam coast is a key site, with a past record of 2,000 birds in 1982. The most important site in Kenya is the Sabaki River mouth, where a count of 9,000-10,000 was reported in 1978 and up to 2,500 have been observed regularly in recent years. In southern Somalia, over 3,000 have been recorded on several occasions near Jowhar and Maxan (Ash & Miskell 1998). No key sites have been identified in Mozambique.

Protection status of key sites

In Madagascar, the North Pangalanes wetlands and wetlands of the Tsiribihina River and Delta are unprotected, whilst a part of the Mangoky Delta complex is partially protected as a Hunting Reserve (ZICOMA 1999 & 2001). The Dar es Salaam coast of Tanzania is an IBA, but is unprotected and subject to a range of threats, largely resulting from urban sprawl and unplanned developments, such as pollution and habitat degradation (Baker & Baker 2001). The Sabaki River mouth in Kenya is unprotected, and the estuary is heavily used and disturbed by people, although there is little direct harassment of birds (Bennun & Njoroge 1999). The key sites in Somalia are unprotected and are not far from the capital city, Mogadishu. These areas are subject to various threats, though some, such as the collection of firewood, may not be detrimental to the pratincole. In summary, none of the key breeding and non-breeding sites is adequately protected, which, given the Globally Threatened status of the species, gives considerable cause for concern.

Table 15. Key sites for Madagascar Pratincole. Sites where 1% or more of a population has been recorded

Country	Site	Lat.	Long.	Season	Max total	Year max	Average total	Basis for average	Source
Kenya	Sabaki river mouth	-3.17	40.13	Non-breeding	2500	1999			Bennun & Njoroge 1999
Madagascar	Lac Ihotry	-21.63	43.65	Non-breeding	250	1990s			ZICOMA 1999
Madagascar	North Pangalanes wetlands	-18.68	49.22	Non-breeding	121	1990s			WBDB
Madagascar	Tsiribihina delta & upper Tsiribihina river	-19.75	44.43	Non-breeding	250	1990s			ZICOMA 1999
Somalia	Near Jowhar	02.53	45.78	Non-breeding	3000	-			Ash & Miskell 1998
Somalia	Near War Maxan	2.4	45.02	Non-breeding	3000	-			Ash & Miskell 1998
Tanzania	Dar es Salaam coast	-6.83	39.32	Non-breeding	2000	1982			WBDB

Tim Dodman, David Stroud & Simon Delany

Gyorgy Szmuk

Pied Avocet

Recurvirostra avosetta

Geographical variation and distribution

The Pied Avocet is a monotypic species, and the only geographical variation reported is some clinal increase in size from Western Europe east across Asia (del Hoyo *et al.* 1996). Southern African birds are quite distinct from European birds in having bright red eyes from about a year old (Tree 1992); this is also a feature of birds from East Africa (Tree *in litt.* 2008). The breeding range includes Southern and Eastern Africa, Western and Southern Europe and Central Asia between 35° and 50°N (Snow & Perrins 1998), and there are isolated breeding sites in North-west Africa and South-west Asia. The breeding distribution is very patchy throughout the whole range of the species (Cramp & Simmons 1983). Outside the breeding season, Pied Avocets occur on the coasts of Western Europe south of 52°N, on African coasts, in parts of Southern, Eastern and Western Africa, and on parts of the South Asian coastline (Cramp & Simmons 1983, del Hoyo *et al.* 1996).

Movements

The Southern African population is partly resident or moves nomadically, mainly in response to rains, according to the availability of suitable ephemeral wetlands (Tree 1997). Birds of the Eastern Africa population are also largely resident, mainly within the Rift Valley, with local movements in response to rain. Britton (1980) suggested that a southern origin is likely for non-breeding flocks in Kenya and Tanzania between June and August. Birds breeding in Southern Europe and North-west Africa may also be resident, but mostly migrate relatively short distances. All other populations are migratory. Pied Avocets breeding in Western Europe winter mainly on the Atlantic coast between southern Britain and northern France, and West Africa, possibly as far south as Guinea Conakry (Altenburg & Van der Kamp 1988). Pied Avocets breeding in South-east Europe winter mainly on the coast of the central and eastern Mediterranean, and may penetrate into inland Africa. The origins of the birds wintering in West Africa are not yet completely unravelled. Ringing results show that at least some West European individuals winter there (Blomert *et al.* 1990), but low percentages of colour-ringed avocets in all wetlands of Senegal (H. Hötker unpubl. obs.) suggest an influx also from other populations.

Pied Avocets breeding in Western and Central Asia move south or south-west to winter in the Middle East, North-east Africa (probably south to Ethiopia and Sudan), Pakistan and western India. There are marked increases at Lake Turkana and Lake Baringo in northern Kenya between October and May, suggesting the presence of non-breeding migrants (Lewis & Pomeroy 1989). East-central Asian birds winter on the coasts of southern China.

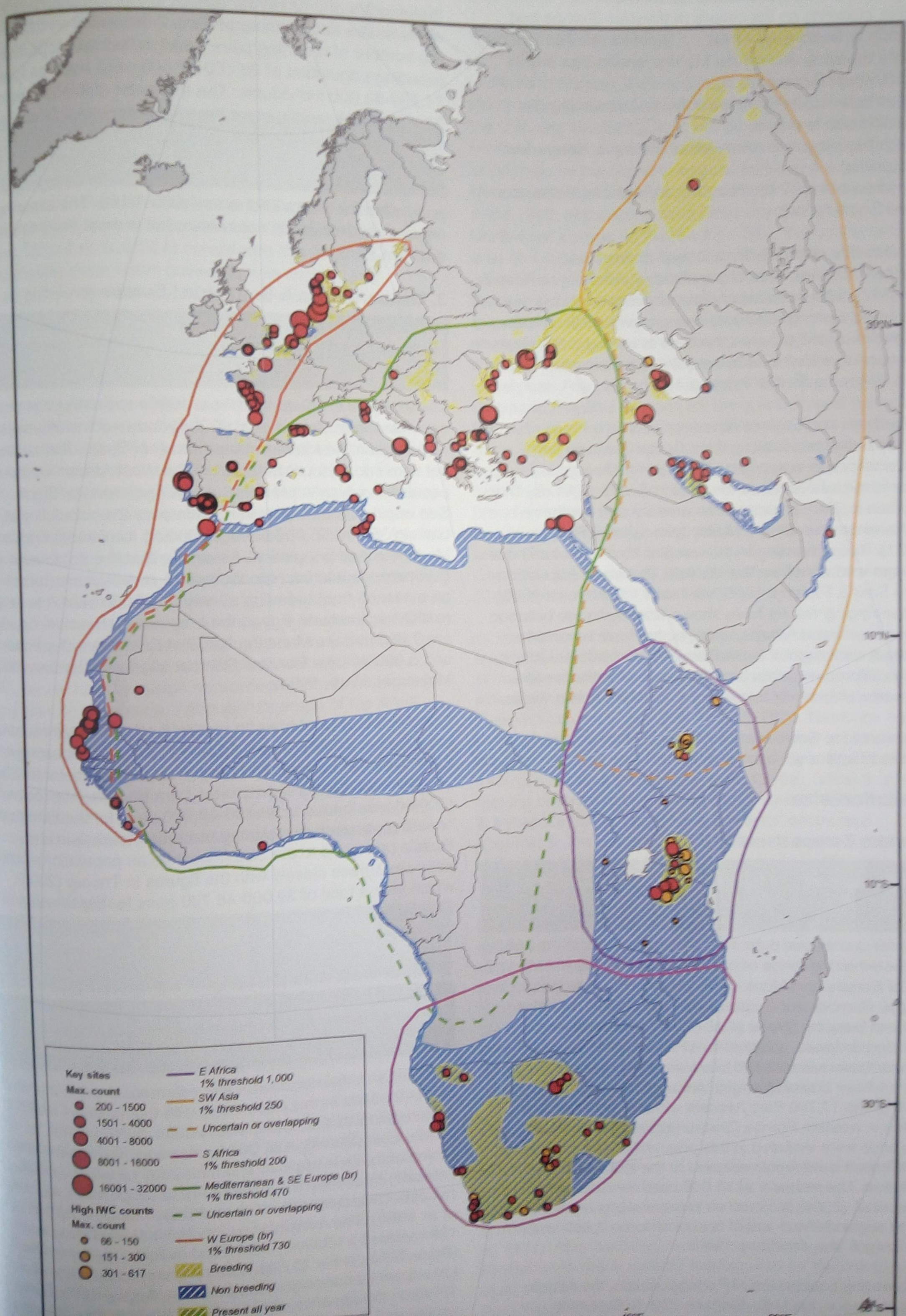
After the breeding season, many birds congregate in big flocks for their postnuptial moult. Movements to moulting sites can occur in directions differing from the direction of migration to the winter quarters (Dietrich & Hötker 1991). The most important moulting sites for West European avocets are the Jadebusen (Germany: up to 22,000), the island of Rømø (Denmark), the Dollard (Dutch/German border), and the Frisian coast and Ijsselmeer (The Netherlands) (Glutz von Blotzheim *et al.* 1977, Dietrich & Hötker 1991, Meltofte *et al.* 1994). Important moulting sites in South-east Europe include Lake Antonov in Bulgaria (Kube *et al.* 1998).

A fairly high degree of site fidelity has been demonstrated in the winter quarters (Hötker 1998). However, Pied Avocets often move considerable distances between their place of birth and first breeding site, or between breeding sites in consecutive years (H. Hötker unpubl. obs.).

Population limits

Breeding Pied Avocets disperse over long distances and there is considerable interchange between populations. The

Pied Avocet
Recurvirostra avosetta



population limits listed here should therefore be regarded as a chiefly descriptive means of separating flyway populations for conservation purposes. Five main populations can be identified within Western Eurasia and Africa:

1) birds breeding on the coasts of Western Europe and locally in North-west Africa;
2) birds breeding around the Mediterranean Sea and in South-east Europe;
3) birds breeding in South-west Asia (Caspian region, Kazakhstan and Iran);
4) birds breeding in Eastern Africa (Ethiopia, Kenya and Tanzania);
5) birds breeding in Southern Africa (Namibia, Botswana and South Africa).

This separation of populations, based on improved knowledge of movements of populations, differs from Rose & Scott (1997), who defined only four populations in the region. These authors recognised only a single population in sub-Saharan Africa and grouped the birds breeding in the western Mediterranean with the birds breeding elsewhere in Western Europe (following Smit & Piersma 1989).

The Southern and Eastern African populations have been separated because no interchange between these two populations is suspected (Tree 1997), although no northern limit was ascribed for birds in Southern Africa. This population is likely to extend into western and southern Zambia, where breeding has also taken place (Benson *et al.* 1971). Birds breeding in the western Mediterranean have now been excluded from the Western European population (contra Smit & Piersma 1989, Wetlands International 2000) because ringing results have shown little exchange between Mediterranean and Atlantic colonies, but have revealed a significant exchange of individuals between different Atlantic colonies. Moreover, birds breeding on the Mediterranean coast seem only rarely to reach the Atlantic coast in winter.

The limits of the South-west Asian population are poorly understood and require more research.

Population size

1.Western Europe (breeding)

Population estimate	1% threshold	Population trend
73,000	730	Stable

Midwinter counts and estimates of Pied Avocets in the 1990s from the wintering range of this population on the Atlantic coast of Europe and Africa south to Morocco, Mauritania, Senegal, Gambia and Guinea total 72,580 birds, and this figure was used by Stroud *et al.* (2004) in their revised population estimate, adopted in *WPE3* and *WPE4*. Included in this estimate were 22,500 birds wintering south of the Sahara whose breeding origins are uncertain. A total of 15,000 of the 17,700 Pied Avocets wintering in France are counted in western France (Deceuninck & Mahéo 2000), and these birds were included in this population. The remaining 2,700 French birds were assigned to the Mediterranean population. The estimate of 16,000 used for Guinea by Stroud *et al.* (2004) is based on extrapolations of counts in coastal wetlands from actual counts of some 3,300 birds (Altenburg & Van der Kamp 1985).

The breeding populations of Portugal, Spain, the Atlantic coast of France, the U.K., Belgium, The Netherlands, Germany, Denmark, Sweden, Norway, Lithuania and Estonia totalled about 28,700-32,000 breeding pairs in the mid-1990s (data from Thorup 2006). The core breeding area is the Dutch-German-Danish Wadden Sea, where 10,517 pairs were counted in 1996, a decrease from 11,990 in 1991 (Rasmussen *et al.* 2000). Aspects of Pied Avocet demographics (delayed maturity, low productivity) suggest that a factor of 2.5x rather than 3x is more appropriate to estimate the total number of birds in a population from the number of breeding pairs. Using a factor of 2.5x, the breeding population of 28,700-32,000 pairs equates to about 71,750-80,000 individuals. The mid-point of this range, 75,875, is only a little more than the estimate of 72,580 from assessments outside the breeding season. Van der Winden *et al.* (2007) counted 1,023 Pied Avocets in Yawri Bay, Sierra Leone in January-February 2005, estimating the total population for Sierra Leone as 1,000-1,100. The breeding origin of these birds is not known, but is most likely to be in Western Europe.

2. Mediterranean & South-east Europe (breeding)

Population estimate	1% threshold	Population trend
47,000	470	Stable or decreasing

The total of 47,100 derived from 1990s midwinter counts and estimates from Stroud *et al.* (2004) does not include birds wintering on the Mediterranean coast of Spain. It also does not take into account that part of the West African wintering population which is probably of Mediterranean or Black Sea origin. Kube *et al.* (1998) estimated the population to contain 35,000-55,000 birds, excluding the (small) French Mediterranean population. Assuming that the South-east European population has declined in recent years (based on evidence from breeding surveys), 47,000 seems to be a realistic estimate. In Egypt, the only comprehensive counts are 9,000 at Lake Manzala, 9,000 at El Malaha, Bur Fuad, and 3,000 at Lake Burullus Ramsar site (all in January 1990: Meininger & Atta 1994).

Collation of national breeding totals for the relevant countries from Thorup (2003) gives 10,392-16,699 pairs, equating to 25,980-41,748 individuals (using a conversion factor of 2.5x – see above). National estimates from BirdLife International (2004a) give a total of 36,300-49,220 pairs for the European breeding population excluding Armenia, Azerbaijan and Russia (assigned to the South-west Asian population). This estimate agrees closely with the figures in Thorup (2003), which give a total of 39,000-48,700 pairs for the Western Europe and Mediterranean & South-east Europe populations combined.

3. South-west Asia (breeding)

Population estimate	1% threshold	Population trend
B (10,000 -25,000)	Provisionally 250	Possibly stable

The 1990s midwinter counts and estimates provide a total of 16,491 birds in this population, with the majority (10,688) wintering in Ethiopia and the remainder (5,803) in the Middle East (Stroud *et al.* 2004). However, the origin of the Ethiopian birds is unclear, and there may be some overlap here with birds from the Eastern African population, as Pied Avocets have been recorded breeding in Ethiopia (Urban *et al.* 1986). The midwinter counts in South-west Asia in 1994 yielded a total of 10,600 Pied Avocets, mainly in Iran (Rose 1995), while 13,600 were recorded on passage at Lake Uromiyeh in north-western Iran in August 1973 (Scott 1995). In the absence of more detailed information, the rough estimate of B (10,000-25,000 birds) in *WPE2* was retained in subsequent editions of *WPE* and by Stroud *et al.* (2004). However, recent estimates from extreme South-east Europe (Caspian drainage) include 500-5,000 pairs in Azerbaijan

20-80 pairs in Armenia and 1,100-2,700 pairs in Russia (BirdLife International 2004a), while 2,000-2,500 pairs were found breeding in Iran in the 1970s (Scott 1995). These figures, which exclude any birds breeding in the Central Asian Republics, indicate a minimum of 3,620-10,280 pairs (10,900-30,800 individuals), and suggest that the estimate of 10,000-25,000 may be too low.

4. Eastern Africa

Population estimate	1% threshold	Population trend
C (25,000-100,000)	Provisionally 1,000	Unknown

January counts and estimates in the 1990s give a total of 18,085 birds in Eastern Africa (African Waterbird Census reports). Stroud *et al.* (2004) considered this to be an underestimate since count coverage was limited, and referred to an observation of 45,000 individuals in Kenya mentioned by Hayman *et al.* (1986). Stroud *et al.* (2004) therefore proposed a rough estimate of C (25,000-100,000), and this was adopted in *WPE3* and *WPE4*. However, it may be unsafe to base the population size on counts made in January, when there are almost certainly birds of Palearctic origin present in the sub-region. This is supported by an observation of a bird flying north with a flock of Whimbrel *Numenius phaeopus* in April (Ash & Miskell 1998). Baker (1996) suggests that large flocks in the Rift Valley in January are likely to be breeding elsewhere, and estimates a non-breeding population of 12,000-15,000 birds. The Pied Avocet breeds in northern Tanzania during January (when most count data are obtained), and yet flocks of 4,956 at Lake Magadi and 2,000 birds at Lake Eyasi in northern Tanzania in January 1995 were recorded in areas that were not suitable as breeding habitat. However, laying dates vary between the different climatic regions of Eastern Africa (Urban *et al.* 1986), so it is hard to assign non-breeding flocks in January to any specific population. Although coverage of the AfWC counts in July is not as wide as that in January, numbers are significantly lower in July. Thus the Eastern Africa population may be lower than previously supposed. Improved and more widespread monitoring, especially during July (when the possibility of counting birds of Palearctic origin can be discounted) would help in developing a better population estimate.

5. Southern Africa

Population estimate	1% threshold	Population trend
15,000- 25,000	200	Possibly increasing

At times there are high counts from northern Botswana, such as 3,580 at Rysana Pan in the Makgadikgadi system in August 2000 (Tyler 2001). Kalejta-Summers *et al.* (2001) estimated 7,600 from South African coastal wetlands. Elsewhere on the coast there are often aggregations of more than 1,000 at Walvis Bay, Namibia, with total counts at times of more than 3,000 for Namibia (AfWC database), whilst there may only be around 200 along the coast of Mozambique (Parker 1999). Tree (1997) estimated a population of 10,000-20,000 birds in Southern Africa. Stroud *et al.* (2004) gave an estimate of 19,300 individuals based on "best-guess" estimates for the relevant countries, and this estimate was adopted in *WPE3* and *WPE4*. However, Dodman (2002) suggested that it would be more appropriate to present a range, as the size of this population is not as well known as this figure implies. Further, the figures used per country tend to reflect maximum counts, which may be misleading given that these birds make regional movements. Hockey *et al.* (2005) and Dodman (in press 2009) followed Tree's (1997) estimate,which has also been adopted here.

The population has increased significantly in range and number since the early 1900s, and may still be on the increase. Tree (*in litt.* 2008) recommends a revised range estimate of 15,000 – 25,000, which is followed here.

Conservation status

In Western Europe, the population declined severely during the nineteenth century and the species became extinct in the U.K. and Sweden (Glutz von Blotzheim *et al.* 1977). Probable reasons for the decline were increased disturbance of colonies by hunting and egg-collecting and a cooling of climate in Western Europe. Since the 1920s, and particularly since 1940, populations have been increasing throughout North-west Europe. In the Wadden Sea, the core breeding area of the population (supporting 13,000 of the 25,000 pairs), the increase stopped around 1990 and the number has remained stable or declined slightly since then. In other regions, increases remain evident (e.g. in France), and dramatic increases have been recorded at some colonies. BirdLife International (2004a) reported recent increases in Belgium, France and Spain, and a decrease only in Denmark. Possible reasons for the upward trend during the twentieth century include: better protection from hunting (both in breeding and non-breeding sites); cessation of egg-collecting; an improving food supply via eutrophication (van Impe 1985, Beukema & Cadée 1986); creation of new breeding habitat as an indirect consequence of coastal engineering (Meininger *et al.* 1998); new nature reserves and protected sites (mostly on the Atlantic coast in France; Deceuninck & Mahéo 1998a); deliberate habitat management (Cadbury *et al.* 1989); and climatic warming.

At least some of the breeding populations in the Mediterranean and South-east Europe followed the trends of the West European populations and declined in the nineteenth century before recovering in the middle of the twentieth century (Tinarelli & Baccetti 1989, Nankinov 1989). In recent years, populations have been stable in parts of the range of this population, e.g. in Italy (Tinarelli & Baccetti 1989) and in southern Russia (Belik 1998a), whilst in other regions declines have been reported (Kinda 1998, Rudenko & Rybachuk 1998), mostly due to habitat destruction (Goutner & Jerrentrup 1987). BirdLife International (2004a) reports an increase in Italy, and decreases in Albania, Bulgaria and Turkey.

In Southern Africa, the size of the Pied Avocet population increased during the twentieth century because more permanent artificial wetlands became available as breeding and resting sites (Tree 1997). The conservation status of the Eastern African and South-west Asian populations is largely unknown. In Eastern Africa, there is a wide range of breeding and feeding habitats within the Rift Valley, many of them falling within protected areas, and there is no current reason for conservation concern about the population.

Habitat and ecology

Most Pied Avocets breed in colonies that, in rare cases, may be as large as several hundred pairs. Single nests are less common. Nesting takes place on small islands, on beaches, on saltmarshes or on arable land (Glutz von Blotzheim *et al.* 1977). After hatching, families can travel up to several kilometres to reach suitable feeding sites for the chicks, e.g. open mudflats or shallow ponds. In large parts of the range, Pied Avocets breed in ephemeral wetlands such as saline lakes and pans filled by irregular rainfall. In some countries, notably in Southern Europe, artificial wetlands (salt pans, reservoirs and fishponds) are the most important breeding

habitats. In North-west Europe, breeding is almost completely confined to coastal habitats, in particular saltmarshes.

Outside the breeding season, the species tends to occur in very large concentrations at only a few wetlands, mostly in coastal habitats, notably inter-tidal mudflats and coastal lagoons. Salt pans, fishponds and shallow lakes may also hold large numbers of birds in some regions.

Network of key sites

Most of the key sites for the Western European population have now been identified. There is some uncertainty about the significance of sites in West Africa for West European birds, as noted above. The preference of Pied Avocets for particular sites, however, may change quickly as the example of the Dollard in the German-Dutch Wadden Sea shows. The Dollard was the most important autumn staging site for West European birds in the 1970s (up to 20,000), but has now lost its significance in favour of other sites.

Most of the key sites for the Mediterranean and South-east European population and the African populations are probably known, but the less comprehensive coverage of the waterbird counts in these regions makes it likely that some important sites have been missed. In Eastern Africa, several Rift Valley lakes, such as Lake Elementeita and Lake Magadi in Kenya, as well as a large number of ephemeral wetlands and small pools, are used for breeding. The use of ephemeral wetlands for breeding in the African and Asiatic parts of the range means that sites important ni some years may be abandoned in others. A wide range of sites surpass the 1% threshold for the Southern Africa population, notably the Makgadikgadi system, especially Rysana Pan, in Botswana (Tyler 2001), Sandwich Harbour and Walvis Bay in Namibia, and Bloemhof Dam, Lake St Lucia, Nqweba Dam, Orange River Estuary, Platfontein Pans and Rondevlei Nature Reserve in South Africa (AfWC database).
The relatively few key sites for the South-west Asian population probably reflect incomplete coverage in this region. Outstanding sites include Lake Tengiz in Kazakhstan, Kyzyl-Agach Bay, Kura River Estuary and Shirvan Reservation Lakes in Azerbaijan, and Lake Uromiyeh and Naseri Marsh in Iran. Barr al Hikman in Oman normally holds low numbers, but qualifies as a key site on the basis of a count of 1400 in 1997.

Protection status of key sites

Most of the key sites of the West European population have at least some protection. Shellfishing seems to be the principal cause of disturbance in France (Le Dréan *et al.* 2007) and loss of habitat due to harbour developments, particularly at the Seine and Loire estuaries has also adversely affected this species in France (Mahéo *et al.* 2007). Disturbance from hunting is still a problem at some French and Portuguese sites, and small-scale habitat loss (land reclamation in estuaries, transformation of salt pans into fish farms) occurs at many. Pollution of water and sediments is likely to be a problem in some estuaries.

For other populations, especially those in the Mediterranean, South-east Europe and South-west Asia, the large majority of key sites are not well protected. Habitat deterioration, hunting and disturbance by humans seem to affect many of these (del Hoyo *et al.* 1996).

Many of the sites important for the population in Eastern Africa, especially for breeding, enjoy some form of protected status. Lake Magadi, a regular breeding site in Kenya, is not protected, although the lake faces no obvious conservation problems at present (Bennun & Njoroge 1999). In Southern Africa, Sandwich Harbour in Namibia is fully protected (Simmons *et al.* 1998), as is Rondevlei Nature Reserve in South Africa. The Makgadikgadi Pans in Botswana are partially protected, with the most important area for avocets under National Park status (Tyler & Bishop 1998), as are Lake St Lucia and Mkuze Swamps in South Africa (Johnson *et al.* 1998).

Table 8. Key sites for Pied Avocet. Sites where 1% or more of a population has been recorded
Note: This species is well known for inconsistent and opportunistic usage of sites

Country	Site	Lat.	Long.	Season	Max total	Year max	Average total	Basis for average	Source	Population(s) at site
Albania	Karavasta Complex	40.92	19.48	Non-breeding	1763	1993	299	1999-04 (5)	IWC database	Mediterranean & SE Europe
Albania	Patok (Complexe De Patoku)	41.60	19.57	Non-breeding	1034	1993	172	1995-04 (5)	IWC database	Mediterranean & SE Europe
Algeria	Sebkha d'Oran	35.37	-0.80	Non-breeding	1250	1979			WBDB	Mediterranean & SE Europe
Austria	Lake Neusiedl/ & Seewinkel	47.75	16.83	Breeding	750 239 prs +165 juv	2007			J Laber *in litt.*	Mediterranean SE Europe
Azerbaijan	Big Kyzyl-Agach Bay	39.17	49.00	Non-breeding	4250	1997	3326	1996-97 (2)	IWC database	SW Asia
Azerbaijan	Hagygabul Gyolu (Hadgegabol Lake)	40.00	48.92	Non-breeding	3000	1996			IWC database	SW Asia
Azerbaijan	Kirov Bay	39.08	48.95	Post-breeding migration	300	1985			Shubin, 1998	SW Asia
Azerbaijan	Kura River Estuary	39.33	49.33	Non-breeding	9730	1997			IWC database	SW Asia
Azerbaijan	Shirvan Reservation Lakes	39.67	49.17	Non-breeding	6000	1997	3035	1996-97 (2)	IWC database	SW Asia
Belgium	Harbour area Antwerpen Linkeroever	51.28	4.23	Breeding	939	2001	609	1999-03 (5)	INC, Belgium 2005	E Atlantic
Belgium	Zeeschelde Estuary	51.33	4.25	Non Breeding	1106	1995	500	2001-05 (5)	INC, Belgium 2005	E Atlantic

Country	Site	Lat.	Long.	Season	Max total	Year max	Average total	Basis for average	Source	Population(s) at site
Botswana	Makgadikgadi Pans	-20.75	25.50	July	335	1993			S Tyler *in litt.*	S Africa
Botswana	Nata Delta	-20.33	26.08	July-August	335	1993	169	1991-93 (2)	AfWC database	S Africa
Botswana	Rysana Pan	-21.25	25.07	Non-breeding	5094	2000	1710	1994-01 (3)	AfWC database	S Africa
Bulgaria	Atanasovo lake	42.57	27.48	Migration	7570	1997			WBDB	Mediterranean & SE Europe
Bulgaria	Bourgas Bay	42.50	27.47	Post-breeding migration	20000	1995			Kube *et al.* 1998	Mediterranean & SE Europe
Denmark	Bøvling Fjord	56.40	8.15	Autumn	2545	1999			H Meltofte *in litt.*	W Europe
Denmark	Eastern part of Vejlerne	57.05	9.00	Breeding	840	1994			WBDB	W Europe
Denmark	Harboøre Tange	56.65	8.17	Autumn	1062	1990			H Meltofte *in litt.*	W Europe
Denmark	Northwestern Kattegat	57.20	11.00	Breeding	1554	1996			WBDB	W Europe
Denmark	Ringkøbing Fjord	56.00	8.25	Breeding	2010	1998			WBDB	W Europe
Denmark	Saltbæk Vig	55.75	11.17	Breeding	1500	1998			WBDB	W Europe
Denmark	Tipperne	55.88	8.24	Autumn	1437	1999			H Meltofte *in litt.*	W Europe
Denmark	Wadden Sea - Denmark	55.16	8.58	Autumn	5671	2001	3652	1999-02 (4)	NERI, Denmark, 2005	W Europe
Egypt	El Malaha. Bur Fuad	31.22	32.32	Non-breeding	8910	1990	4920	1980-90 (2)	IWC database	Mediterranean & SE Europe
Egypt	Lake Burullus	31.50	30.75	Non-breeding	2949	1990	1478	1990-94 (2)	IWC database	Mediterranean & SE Europe
Egypt	Lake Manzala	31.27	32.03	Non-breeding	9491	1990	3795	1979-90 (3)	IWC database	Mediterranean & SE Europe
Ethiopia	Lake Abijatta	7.55	38.52	Non-breeding	1471	1993	231	1997-01 (5)	AfWC database	E Africa
France	Baie de Bourgneuf et Noirmoutier	47.04	-2.12	Non-breeding	3102	2000	2441	1999-04 (5)	R Mahéo, LPO. *et al* 2005	W Europe
France	Baie de l'Aiguillon et Pointe d'Arçay	46.32	-1.17	Non-breeding	8288	2004	4508	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
France	Baie de Vilaine	47.47	-2.51	Non-breeding	2147	2002	1639	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
France	Bassin d'Arcachon et Banc d'Arguin	44.67	-1.12	Migration	5550	2003			R Mahéo, LPO *et al.* 2005	W Europe
France	Camargue	43.52	4.60	Non-breeding	1944	1995	1030	1999-04 (5)	R Mahéo, LPO *et al.* 2005	Mediterranean & SE Europe
France	Nature Reserve Moëze et Ile d'Oleron	45.97	-1.47	Non-breeding	902	1992	439	1990-03 (5)	IWC database	W Europe
France	Estuaire Seine	49.43	0.30	Migration	5000	1997			R Mahéo, LPO *et al.* 2005	W Europe
France	Etangs de Thau et de Bagnas	43.37	3.52	Non-breeding	1424	1992	19	1999-04 (5)	R Mahéo, LPO *et al.* 2005	Mediterranean & SE Europe
France	Etangs Montpellierains	43.57	3.89	Non-breeding	1611	2003	1065	1999-04 (5)	R Mahéo, LPO *et al.* 2005	Mediterranean & SE Europe
France	Golfe du Morbihan	47.56	-2.79	Non-breeding	1294	2000	1052	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
France	Ile de Re	46.22	-1.50	Non-breeding	1835	1995	754	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
France	Lac du Salagou	43.67	3.33	Non-breeding	1424	1992	561	1988-92 (5)	R Mahéo, LPO *et al.* 2005	Mediterranean & SE Europe
France	Loire Aval	47.27	-2.18	Non-breeding	2590	1997	846	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
France	Marais d'Olonne	46.52	-1.79	Non-breeding	1224	1998	154	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
France	Marais poitevin et baie de l'Aiguillon	46.33	-1.00	Non-breeding	1500	2003			WBDB	W Europe
France	Marais salants de Noirmoutier	46.98	-2.27	Breeding	765	1991			WBDB	W Europe
France	Petite Camargue laguno-marine	43.52	4.27	Breeding	1200	1991			WBDB	Mediterranean & SE Europe
France	Presqu'île Guérandaise dont Traicts du Croisic	47.29	-2.51	Non-breeding	2750	2001	1841	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
France	Résèrve Naturelle de Moeze (Charente-Seudre)	45.83	-1.14	Non-breeding	1815	1997	698	1999-04 (5)	R Mahéo, LPO *et al.* 2005	W Europe
Germany	Einswarder & Tegeler Plate	53.52	8.52	Autumn	2100				Melter & Schreiber 2000	W Europe
Germany	Ems valley Leerm to Emde	53.32	7.33	Autumn	1053				Melter & Schreiber 2000	W Europe
Germany	Krummhörn-Westermarsch	53.48	7.07	Autumn	3500				Melter & Schreiber 2000	W Europe

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Germany	Rheiderland	53.23	7.32	Autumn	2200				Melter & Schreiber 2000	W Europe
Germany	Wadden Sea - Lower Saxony NP Lower Saxony	54.00	8.00	Autumn	30392	1994	12594	1997-01 (5)	J.Blew, K *in litt.* TMAP	W Europe
Germany	Wadden Sea Schleswig-Holstein	- 54.50	8.50	Breeding	>10000		8000		J.Blew, CWSS, 2005	W Europe
Germany	West Pomerania coast	54.43	12.90	Moult	2600	1992	1943	1992-04	Dierschke & Helbigl in press.	W Europe
Ghana	Keta Lagoon complex	5.92	-0.83	July-August	1144	2000			AfWC database	Mediterranean & SE Europe
Greece	Alyki Kitrous	40.42	22.38	Non-breeding	670	1989	82	1994-99 (5)	IWC database	Mediterranean & SE Europe
Greece	Arogi Lagoon (Karatza)	40.93	25.85	Non-breeding	958	1998	456	1997-01 (5)	IWC database	Mediterranean & SE Europe
Greece	Axios, Loudias & Aliakmon Deltas	40.48	22.40	Non-breeding	1237	1997	636	1996-00 (5)	IWC database	Mediterranean & SE Europe
Greece	Evros Delta	40.77	26.05	Non-breeding	900	1990	446	1997-01 (5)	IWC database	Mediterranean & SE Europe
Greece	Kerkini	41.22	23.52	Non-breeding	1070	1999	512	1996-00 (5)	IWC database	Mediterranean & SE Europe
Greece	Lake Mitrikou (Ismarida)	40.97	25.28	Non-breeding	2500	1996			WBDB	Mediterranean & SE Europe
Greece	Lakes Volvi-Langada	40.68	23.37	Migration	1150	1995			WBDB	Mediterranean & SE Europe
Greece	Messolonghi Lagoon	38.33	21.22	Non-breeding	1540	2001	772	1997-01 (5)	IWC database	Mediterranean & SE Europe
Greece	Ptelea Lagoon (Karakatsali) / Elos	40.93	25.85	Non-breeding	2285	1989	501	1997-01 (5)	IWC database	Mediterranean & SE Europe
Greece	Spercheios Delta (Lamia)	38.83	22.40	Non-breeding	3500	1989	1116	1993-98 (5)	IWC database	Mediterranean & SE Europe
Guinea	Kobayah	9.67	-13.50	Non-breeding	2205	1988			AfWC database	W Europe
Guinea	Vasières de Sonfonia	9.67	-13.56	Non-breeding	1482	1999	826	1999-00 (2)	AfWC database	W Europe
Iran	Bandar Mahshahr Saltworks (Mahshahr Saltworks)	30.54	40.97	January	304	2007	221	2004-07 (3)	DOEI / WIWO	SW Asia
Iran	Gomishan marshes & Turkoman Steppes	37.25	53.92	January	641	2004	330	2004-07 (3)	DOEI / WIWO	SW Asia
Iran	Hamidieh (Omidiyeh) Plains	31.52	48.18	January	1131	2005	799	2004-05 (2)	DOEI / WIWO	SW Asia
Iran	Harm Lake	28.17	53.5	January	412	2005	137	2004-07 (3)	DOEI / WIWO	SW Asia
Iran	Hilleh River Delta	29.19	50.78	Wintering	300	1975			Evans, 1994	SW Asia
Iran	Hoveyzeh Marshes	31.29	47.95	January	683	2007	252	2004-07 (3)	DOEI / WIWO	SW Asia
Iran	Izeh and Sheikho Lakes	31.87	49.90	Wintering	400	1992			Evans, 1994	SW Asia
Iran	Lake Bakhtegan, Lake Tashk & Kamjan Marshes	29.67	53.50	August	1000	1970s			Evans, 1994	SW Asia
Iran	Lake Uromiyeh	37.50	45.50	August	13600	1973			Scott, 1995	SW Asia
Iran	Miankaleh Peninsula & Gorgan Bay	36.83	53.45	January	622	2007	540	2004-07 (3)	DOEI / WIWO	SW Asia
Iran	Mirza Koochak Khan Farm	30.88	48.28	January	423	2005	280	2004-05 (2)	DOEI / WIWO	SW Asia
Iran	Naseri Marsh	30.67	48.17	January	3412	2004	1141	2004-07 (3)	DOEI / WIWO	SW Asia
Iran	Sar Bandar Saltworks, Gulf Coast	30.53	48.97	January	450	2004	236	2004-07 (3)	DOEI / WIWO	SW Asia
Iran	Seheyn Basin Susangerd	31.52	48.18	January	467	2004			Hornman & Van Diek 2004	SW Asia
Iran	Shadegan Marshes, Khor-al Amaya & Khor Musa	30.17	48.67	Wintering	883	1970s			Evans, 1994	SW Asia
Iran	Shur Gol, Yadegarlu & Dorgeh Sangi	37.02	45.52	July	500	1971			Evans, 1994	SW Asia
Iraq	Bahr Al Milh	32.67	43.67	January	300	1979			Evans, 1994	SW Asia
Iraq	Haur Al Haushiya	32.08	46.90	January	500	1979			Evans, 1994	SW Asia
Iraq	Haur Al Suwayqiyah	32.70	45.92	January	373	1975			WBDB	SW Asia
Iraq	Haur Uwainah	31.42	46.33	January	380	1979			Evans, 1994	SW Asia
Italy	Cagliari wetlands	39.18	9.15	Resident	1500	1995			WBDB	Mediterranean & SE Europe

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Italy	Cervia saltpans	44.25	12.35	Breeding	720	1994			WBDB	Mediterranean & SE Europe
Italy	Delta Del Po - Parte Veneta	44.97	12.43	Winter	2458	2003	971	1999-03 (5)	IWC database	Mediterranean & SE Europe
Italy	Laguna Di Venezia	45.40	12.32	Winter	980	2003	641	1999-03 (5)	IWC database	Mediterranean & SE Europe
Italy	Manfredonia	41.48	15.90	Non-breeding	4770	1995	945	1999-03 (5)	IWC database	Mediterranean & SE Europe
Italy	Oristano wetlands & Cape San Marco	39.87	8.48	Non-breeding	2400	1995			WBDB	Mediterranean & SE Europe
Italy	Palmas - Sant'Antioco (Palmas Gulf wetlands)	39.08	8.93	Resident	600	1996			WBDB	Mediterranean & SE Europe
Italy	Salina Di Cervia	44.27	12.32	Non-breeding	522	2001	350	1998-02 (5)	IWC database	Mediterranean & SE Europe
Italy	Stagno Di Cagliari	39.25	9.03	Winter	768	2002	518	1999-03 (5)	IWC database	Mediterranean & SE Europe
Italy	Stagnone di Marsala & Trapani saltpans	37.78	12.50	Breeding	600	1996			WBDB	Mediterranean & SE Europe
Italy	Valli Di Comacchio E Vene Di Bellocchio	44.60	12.18	Non-breeding migration	567	1999	234	1999-03 (5)	IWC database	Mediterranean & SE Europe
Kazakhstan	Tengiz - Korgalzhin lakes	50.50	69.40	Post-breeding	2770	1999	2904	1999-04 (6)	Schielzeth *et al.* in prep.	SW Asia
Kenya	Lake Elmenteita	-0.42	36.20	Non-breeding	4186	1997	1622	1996-00 (5)	WBDB	E Africa
Kenya	Lake Magadi	-1.87	36.28	Non-breeding	1236	1998	751	1996-00 (5)	AfWC database	E Africa
Kuwait	Sulaibikhat Bay	29.33	47.83	Non-breeding	260	2000	92	1990-00 (4)	IWC database	SW Asia
Mauritania	Aftout es Sâheli	17.37	-16.13	Non-breeding	1650	2000			WBDB	W Europe
Mauritania	Bell Ndiaoul et Khurumbum	20.00	-12.00	Non-breeding	800	1972	184	1973-97 (5)	AfWC database	Mediterranean & SE Europe
Mauritania	Chott Boul	16.57	-16.43	Non-breeding	5650	2001			WBDB	W Europe
Mauritania	Diawling National Park	16.22	-16.38	Non-breeding	2200	1974			WBDB	W Europe
Mauritania	Entre Keur Massene	16.55	-16.34	Non-breeding	2056	1999			AfWC database	W Europe
Mauritania	Lac d'Aleg et Diawling	17.08	-13.98	Non-breeding	5200	2001			AfWC database	Mediterranean & SE Europe
Mauritania	Rosso Total	16.50	-16.18	Non-breeding	5650	2001	1388	1997-01 (5)	AfWC database	W Europe
Mauritania	Trarza, Aftout Es Saheli	17.42	-16.25	Non-breeding	9900	2001	5377	1987-01 (5)	AfWC database	W Europe
Morocco	Merja Zerga: Kenitra	34.80	-6.30	Winter	6945	1991	4407	1991-95 (5)	IWC database	W Europe
Namibia	Etosha National Park	-18.80	16.57	Non-breeding	355	1998	113	1992-98 (4)	AfWC database	S Africa
Namibia	Oponono Lake & Oshitunto	-18.00	15.00	July-August	616	1999	318	1999-00 (2)	AfWC database	S Africa
Namibia	Orange river: Total	-28.58	16.87	Non-breeding	374	1998	203	1994-98 (3)	AfWC database	S Africa
Namibia	Sandwich Harbour	-23.38	14.48	July-August	1569	1998	590	1992-00 (5)	AfWC database	S Africa
Namibia	Walvis Bay Ramsar Site	-22.50	14.42	July-August	4102	1997-05	1592	1997-05 (9)	Wearne & Underhill 2005	S Africa
Netherlands	Oostvaardersplassen	52.43	5.35	Non-breeding	4281	1990			WBDB	W Europe
Netherlands	Rhine-Maas-Schelde Delta	51.50	4.00	Winter	3198	2000	1990	1999-03 (5)	RWS WD RIKZ 2005	W Europe
Netherlands	Wadden Sea - Netherlands	53.30	5.38	Autumn	17573	1990	11039	1999-03 (5)	SOVON, The Netherlands, 2005	W Europe
Oman	Barr Al Hikman	20.63	58.47	Non-breeding	1400	1997	725	1997-01 (2)	IWC database	SW Asia
Portugal	Estuário Do Sado	38.53	-8.83	Non-breeding	5855	1996	2480	1997-02 (5)	IWC database	W Europe
Portugal	Estuário Do Tejo	38.75	-9.08	Non-breeding	13661	1989	4642	1996-01 (5)	IWC database	W Europe
Portugal	Ria De Faro	37.00	-7.92	Non-breeding	827	1997	529	1997-01 (5)	IWC database	W Europe
Romania	Danube delta	45.00	29.00	Post-breeding migration	3000	1995			Kube *et al.* 1998	Mediterranean & SE Europe
Romania	Razim-Sinoie Lagoons	44.67	29.00	March	1500	1995			C. Sudfeldt *in litt.*, Schmitz *et al.*2001	Mediterranean & SE Europe
Russia	Bejsug Lagoons	46.17	38.38	Breeding	750	1995			Mischenko 1999, per V. Belik	Mediterranean & SE Europe
Russia	Eastern coast of the Sea of Azov	45.77	38.08	Breeding	2010	1995			WBDB	Mediterranean & SE Europe
Russia	Kiziltash lakes	45.12	37.05	Breeding	900	1995			Krivenko 1998, per V. Belik	Mediterranean & SE Europe
Russia	Kuban river delta	45.70	37.75	Breeding	1260	1995			Krivenko 1998, per V. Belik	Mediterranean & SE Europe

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Russia	Salt-lakes in the Primorsko -Akhtarsk area	46.00	38.17	Breeding	1650	1989			WBDB	Mediterranean & SE Europe
Saudi Arabia	Sabkhat al-Fasl Lagoons	27.00	49.67	Non-breeding	665	1996	425	1992-96 (4)	IWC database	SW Asia
Senegal	Joal Fadiout	14.17	-16.83	Non-breeding	1200	1998	875	1997-98 (2)	AfWC database	W Europe
Senegal	Lac Wouye (Malika)	14.80	-17.37	Non-breeding	3200	1975	857	1972-97 (5)	AfWC database	W Europe
Senegal	Lagunes de St Louis	15.67	-17.00	Non-breeding	3634	2000	1749	1997-01 (5)	AfWC database	W Europe
Senegal	Parc National des Oiseaux de Djoudj	16.42	-16.25	Non-breeding	1755	1998	772	1997-01 (5)	AfWC database	W Europe
Senegal	Parc National du Delta du Saloum	13.83	-16.75	Non-breeding	3788	1999	1914	1987-99 (4)	AfWC database	W Europe
Senegal	Senegal river delta	16.33	-16.48	January	6608	2000			Triplet & Yésou 1998, P. Yésou	W Europe
Sierra Leone	Yawri Bay	08.20	-13.02	January-February	1023	2005			van der Winden *et al.* 2007	W Europe
South Africa	Berg 3: Hotel Mudflats & Estuary	-32.78	18.18	September	533	2005	119	1996-00 (5)	A.J. Tree *in litt.* AfWC database	S Africa
South Africa	Bloemhof Dam	-27.68	25.67	February	836	2004	196	1992-98 (4)	AfWC database	S Africa
South Africa	Chatty SaltPans	-34.00	25.50	January	490	1996			A.J. Tree *in litt.*	S Africa
South Africa	Deelpan	-29.17	25.75	Non-breeding	231	2001			AfWC database	S Africa
South Africa	De Hoop Vlei	34.43	20.38	November	207	2004			A.J. Tree *in litt.*	S Africa
South Africa	Kamfers Dam	-28.67	24.77	Pre-breeding migration	307	2000	202	2000-01 (2)	AfWC database	S Africa
South Africa	Kanhym Pan 1	-25.83	29.52	Non-breeding	368	2001			AfWC database	S Africa
South Africa	Lake St Lucia	-28.07	32.45	May	3400	2007	101	1996-00 (5)	A.J. Tree *in litt.* AfWC database	S Africa
South Africa	Leeu Gamka Dam	-32.60	22.02	Non-breeding	214	1999	66	1998-01 (4)	AfWC database	S Africa
South Africa	Nqweba Dam	-32.22	24.53	Non-breeding	500	2001			AfWC database	S Africa
South Africa	Orange River Estuary	-28.63	16.45	August	890	2001	237	1999-01 (3)	.	S Africa
South Africa	Platfontein Pans	-28.65	24.62	Non-breeding	530	1997			AfWC database	S Africa
South Africa	Redhouse Saltpans	-33.83	25.58	January	248	2004			A.J. Tree *in litt.*	S Africa
South Africa	Paarl Bird Sanctuary	-33.68	18.97	December	218	1997			A.J. Tree *in litt.*	S Africa
South Africa	Rietvlei Wetland Reserve - Dolphin Beach	-33.83	18.47	January	669	1993	60	1994-01 (4)	A.J. Tree *in litt* AfWC database	S Africa
South Africa	Rondevlei Nature Reserve	-34.07	18.50	Non-breeding	1401	1998	803	1997-01 (5)	AfWC database	S Africa
South Africa	Stan Madden Bird Sanct.	-26.40	28.47	Non-breeding	200	1994			AfWC database	S Africa
South Africa	Strandfontein Sewage Works	-34.00	25.50	February	1700	2001			A.J. Tree *in litt.*	S Africa
South Africa	Verloren Vlei	-32.32	18.38	February	1250	2006			A.J. Tree *in litt.* AfWC database	S Africa
South Africa	Voelvlei	-34.27	21.82	January	600	1993	118	1993-97 (4)	A.J. Tree *in litt* AfWC database	S Africa
South Africa	West Coast National Park (Langebaan Lagoon)	-33.08	18.10	July	521	2003			A.J. Tree *in litt.*	S Africa
South Africa	Zandvlei - Upper Estuary	-34.10	18.47	Non-breeding	440	2000	95	1994-01 (5)	AfWC database	S Africa
South Africa	Zwartkops River Estuary	-33.87	25.63	July-August	247	1996	131	1995-99 (5)	AfWC database	S Africa
Spain	Cabo de Gata	36.83	-2.08	Resident	579	1996			WBDB	Mediterranean & SE Europe
Spain	Cádiz Bay	36.53	-6.27	Winter	2738	1996	1921	1996-01 (5)	IWC database	W Europe
Spain	Canal De Guadaira	40.30	-3.75	Non-breeding	2650	1991			IWC database	W Europe
Spain	Caño Del Guadiamar Pnd (H)	36.97	-6.36	Winter	1100	2000			IWC database	W Europe
Spain	Colonia De La Isleta De Puebla (Se)	40.30	-3.75	Non-breeding	2600	1992	735	1994-01 (5)	IWC database	W Europe
Spain	De La Algaida A Hato Villa (H)	36.80	-2.60	Winter	840	1998	324	1990-03 (5)	IWC database	Mediterranean & SE Europe
Spain	Dehesa De Abajo (Se)	40.30	-3.75	Non-breeding	1200	2000	416	1995-01 (5)	IWC database	W Europe
Spain	Delta Del Ebro	40.70	0.80	Non-breeding	1405	1997	883	1997-03 (5)	IWC database	Mediterranean & SE Europe
Spain	La Corta De Los Olivillos. Rio Guadalquivir	37.18	-6.09	Winter	1200	2003			IWC database	W Europe
Spain	Lucio Del Membrillo (H)	36.87	-6.38	Winter	2236	2000	805	1998-00 (3)	IWC database	W Europe
Spain	Lucios de Veta La Palma -Isla Mayor (Se)	36.93	-6.24	Winter	11883	2003	7178	1998-03 (5)	IWC database	W Europe
Spain	Marisma De Hinojos (H)	36.98	-6.38	Winter	1350	1990			IWC database	W Europe
Spain	Marismas Del Odiel	37.26	-6.96	Non-breeding	1374	1992	481	1991-03 (5)	IWC database	W Europe
Spain	Odiel and Tinto marshes & Huelva coastal lagoons	37.25	-6.83	Migration	1550	1996			WBDB	W Europe

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Spain	Par. Nacional de Doñana	36.99	-6.37	Non-breeding	3688	2000	1167	1997-01 (5)	IWC database	W Europe
Spain	Par. Natural De El Hondo	38.16	-0.76	Winter	727	2003	391	1995-03 (5)	IWC database	Mediterranean & SE Europe
Spain	Salina San Federico	40.30	-3.75	Non-breeding	786	1993	394	1993-94 (2)	IWC database	W Europe
Spain	Salinas Cabo De Gata (Al)	36.75	-2.22	Winter	522	1999	295	1998-03 (5)	IWC database	Mediterranean & SE Europe
Spain	Salinas De Bonanza (Hidalgo) (Ca)	36.82	-6.34	Winter	1450	1991	275	1994-01 (5)	IWC database	W Europe
Spain	Salinas De Bonanza (Portugueses) (Ca)	36.88	-6.33	Winter	1243	2000	284	1995-01 (5)	IWC database	W Europe
Spain	Salinas De San Pedro Del Pinatar (Mu)	37.81	-0.77	Non-breeding	1403	1991	21	1994-03 (5)	IWC database	Mediterranean & SE Europe
Spain	Salinas De Santa Pola (A)	38.16	-0.64	Non-breeding	1412	1994	412	1997-03 (5)	IWC database	Mediterranean & SE Europe
Sweden	Coastal areas/Öland Is.	56.67	16.75	Breeding	900	1988			WBDB	W Europe
Sweden	Falsterbo-Bay of Foteviken	55.42	12.92	Breeding	900	1996			WBDB	W Europe
Tanzania	Lake Eyasi	-3.67	35.17	Non-breeding	2002	1995			WBDB	E Africa
Tanzania	Lake Kitangire	-4.10	34.30	Non-breeding	4000	1995			WBDB	E Africa
Tanzania	Lake Manyara N. Park	-3.67	35.83	Non-breeding	4940	1995			WBDB	E Africa
Tunisia	Bahiret El Bibene	35.25	11.25	Winter	900	1993			IWC database	Mediterranean & SE Europe
Tunisia	Gulf of Gabès	34.40	10.32	February	2625	1984			Van Dijk *et al.* 1986	Mediterranean & SE Europe
Tunisia	Lac Ichkeul	37.17	9.67	Winter	662	1992	341	1992-97 (2)	IWC database	Mediterranean & SE Europe
Tunisia	Saline De Thyna	34.65	10.68	Winter	627	1993	511	1990-93 (3)	IWC database	Mediterranean & SE Europe
Tunisia	Sebkha Sidi Mansour	34.23	9.50	Winter	600	1992			IWC database	Mediterranean & SE Europe
Turkey	Akyatan Golu	36.58	35.32	Non-breeding	601	1993	197	1990-99 (5)	IWC database	Mediterranean & SE Europe
Turkey	Beylemi Golu ; Calti [Drained]	37.77	29.68	Non-breeding	647	1999			IWC database	Mediterranean & SE Europe
Turkey	Büyük Menderes delta	37.57	27.20	Non-breeding	1000	1989			WBDB	Mediterranean & SE Europe
Turkey	Kulu lake	39.08	33.15	Non-breeding	1000	1987			WBDB	Mediterranean & SE Europe
Turkey	Marmara Golu	38.58	28.10	Non-breeding	1402	1992			IWC database	Mediterranean & SE Europe
Turkey	Samsam lake	39.10	32.75	Migration	616	1995			WBDB	Mediterranean & SE Europe
Turkey	Sultansazligi	38.33	35.27	Non-breeding	2115	1994			WBDB	Mediterranean & SE Europe
Turkey	Yumurtalik Lagoons (Yapi+Omerg)	36.68	35.65	Non-breeding	1217	1999	390	1990-99 (5)	IWC database	Mediterranean & SE Europe
Ukraine	Molochnyj Liman	46.32	35.32	Breeding	750	1992			WBDB	Mediterranean & SE Europe
Ukraine	Shagany-Alibej-Burnas lake-system	45.78	30.00	Migration	1300	1992			WBDB	Mediterranean & SE Europe
Ukraine	The Sivash, Azov Sea	46.17	34.58	August	25000	1998			Chernichko *et al.* 2001	Mediterranean & SE Europe
Ukraine	Yagorlyts'ka & Tendrivs'ka Bays	46.33	31.83	Breeding	750	1992			WBDB	Mediterranean & SE Europe
U.K.	Alde Complex	52.15	1.53	Winter	1330	2000	1135	1999-03 (5)	BTO, UK, 2005	W Europe
U.K.	Breydon Water & Berney Marshes	52.59	1.66	Autumn	1069	1999-03	770	1999-03 (5)	BTO, UK, 2005	W Europe
U.K.	Medway Estuary	51.40	0.65	Winter	860	1999-03	560	1999-03 (5)	BTO, UK, 2005	W Europe
U.K.	Poole Harbour	50.69	-2.00	Winter	1893	1999-03)	1341	1999-03 (5)	BTO, UK, 2005	W Europe
U.K.	Thames Estuary	51.48	0.57	Winter	1447	1999-03	855	1999-03 (5)	BTO, UK, 2005	W Europe
									IWC database	

Terje Kolaas.

Red-necked Phalarope (Northern Phalarope)

Phalaropus lobatus

Geographical variation and distribution

The Red-necked (or Northern) Phalarope is a monotypic species with a Holarctic breeding distribution. This extends from Alaska and the Aleutians east through northern Canada to Labrador and Baffin Island, Greenland, Iceland, the Faeroes, Scotland, Ireland (now extinct) and Svalbard (few), and thence across Scandinavia and northern Russia from the Kola Peninsula east to the Bering Sea, Kamchatka and the Commander Islands (Cramp & Simmons 1983, Lappo 1998). Lappo (1998) has highlighted extensive breeding areas in the east of the Palearctic range, not previously mapped.

It winters at sea in the Pacific from the Ryukyu Islands and central Pacific south to the Lesser Sundas and New Guinea and off southern South America, and in the Indian Ocean from Eastern Africa to Malaysia. The largest concentrations occur in the south-east Pacific off Peru, in the Arabian Sea and in the South China Sea. The species is locally abundant in offshore waters off Somalia and Kenya, and is fairly common inland in Kenya (especially at Lake Turkana) and on the Ethiopian Rift Valley lakes, but it is rare elsewhere in Africa (Urban *et al.* 1986). It occurs as a rare visitor to the west coast of Southern Africa, and there are old records of birds at sea off Argentina and the Falkland Islands, but no major wintering areas have as yet been discovered in the Atlantic.

Movements

The entire population breeding on the mainland of Western Eurasia (east to about the Taymyr Peninsula) apparently winters at sea off the Arabian Peninsula from the Gulf of Aden east almost to Pakistan. Ringing recoveries have shown that Fennoscandian breeders migrate south-east through the Gulf of Bothnia and Gulf of Finland and across Eastern Europe on a broad front to staging areas in the Black and Caspian Seas (Snow & Perrins 1998, Summers *et al.* 1987, Bakken *et al.* 2003). Here they join up with birds from breeding areas in European Russia. From there the birds continue overland to the Arabian Sea, entering via the Persian Gulf and Gulf of Oman, and spreading west to the Gulf of Aden, but not entering the Red Sea (Cramp & Simmons 1983). West Siberian breeders stage at lakes in Kazakhstan before continuing on to the Arabian Sea. Huge concentrations of birds, presumably of West Siberian origin, have been recorded on migration at large lakes in Kazakhstan and on the Turkoman Steppes in north-eastern Iran (Summers *et al.* 1987). Birds reach the Gulf of Aden by late October, and move south from there to the coast of Somalia and Kenya, with a few birds appearing inland along the northern Rift Valley (Urban *et al.* 1986).

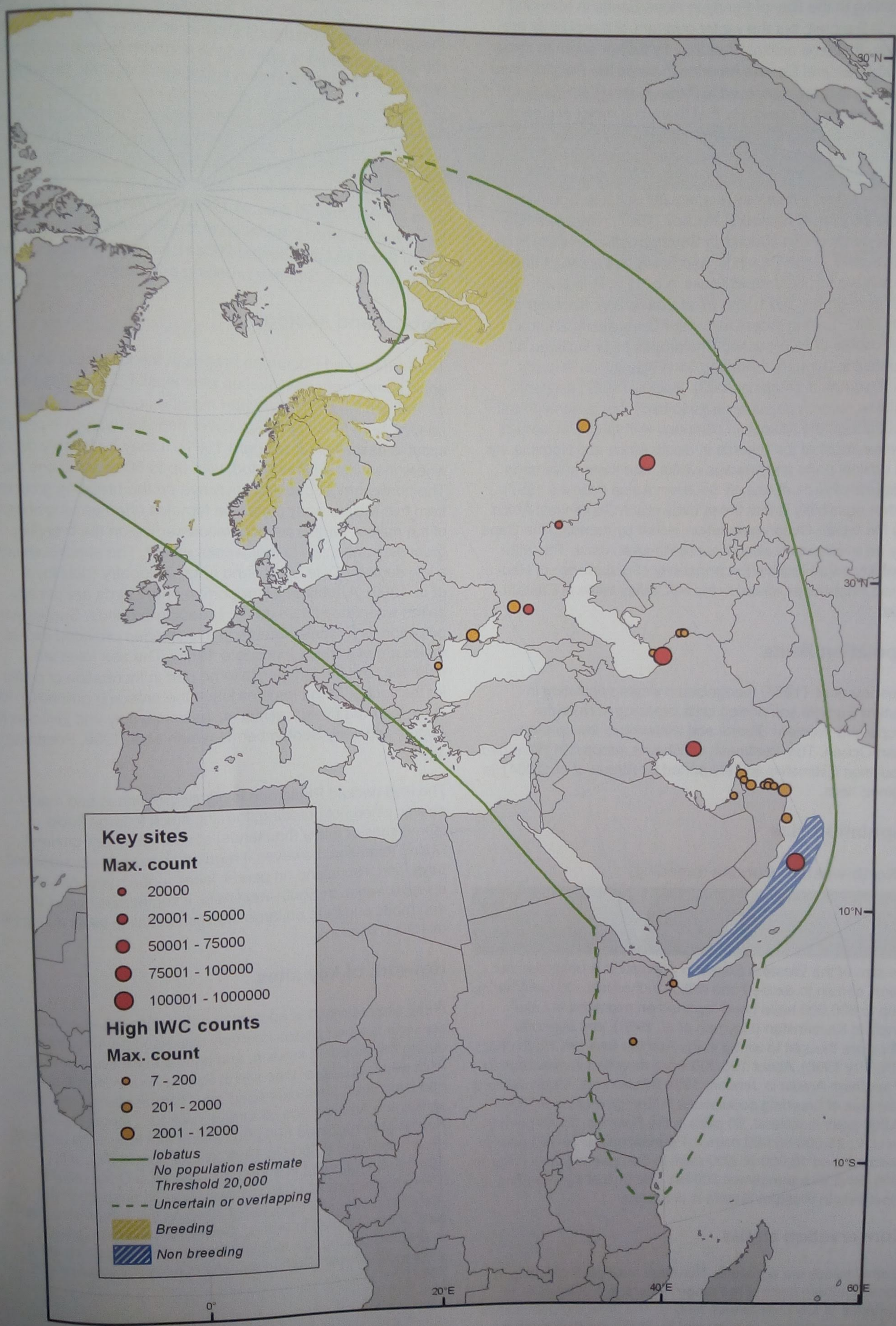
In the south Caspian region, autumn passage takes place between mid-July and mid-October, with a peak in late August and early September. Birds are present on their wintering grounds in the Arabian Sea from late July to the third week of May. Return passage through the Caspian region occurs in the second half of April and first half of May (D.A. Scott unpubl. obs.).

The bulk of the Nearctic breeding population migrates south-west across Canada and the western U.S.A. to the Pacific off California, and thence south to winter quarters in the Humboldt current off South America, especially off Peru. The North-east Asian breeding population and probably also the Alaskan breeding population migrate south through the western Pacific to winter at sea off Indonesia and New Guinea.

The winter quarters of the large Icelandic breeding population and the small populations in East Greenland, the Faeroes and Scotland are unknown. These birds are thought by some authors to cross Europe to join other European and West Siberian breeders in the Arabian Sea, but there is no evidence of any regular movements in the eastern Atlantic, and birds from Iceland and Greenland at least may join the Nearctic population to winter off the Pacific coast of South

Red-necked Phalarope (Northern Phalarope)

Phalaropus lobatus



America (Cramp & Simmons, 1983). Large-scale movements have been recorded on the Atlantic coast of Canada south in some numbers to New England, with up to 2,000,000 birds aggregating in the Bay of Fundy in Nova Scotia in May and August in the past, but the winter quarters of these birds are unknown. It seems unlikely that they fly further south to cross the Caribbean and Central America towards the Pacific, since the species is rarely observed in these zones (del Hoyo *et al.* 1996). It remains a possibility that there is a major wintering area for the species somewhere in the Atlantic, and if so, this is likely to be the destination of the Icelandic breeders.

The Red-necked Phalarope is a regular visitor to Southern Africa in very small numbers. Hockey (1997) refers to a total of 110 records of this species in Southern Africa, mostly from south-western Cape Province, and notes that some of these records have involved small flocks, e.g. 11 at Rondevlei, South Africa, in February 1971, and 27 at Walvis Bay, Namibia, in March 1992. During recent midwinter censuses in Southern Africa, counts of Red-necked Phalaropes have included 43 in Namibia in January 1999 and 56 in Namibia in January 2001 (Dodman & Diagana 2003). Hockey (1997) suggests that these records possibly relate to birds that have migrated south through the Atlantic in company with Grey Phalaropes. However, most of the records in South Africa and Namibia are from coastal pans and sewage works, and there have been no reports of birds at sea off Southern Africa (Hockey 1997). Another possibility is that these birds reach South-west Africa from the Indian Ocean population, either by rounding the Cape or by an overland crossing from North-east Africa. The latter possibility might explain the frequency of occurrence of Red-necked Phalaropes inland in the Rift Valley lakes in Eastern Africa.

Population limits

Perennou *et al.* (1994) recognised a single population in Western Eurasia comprising birds breeding in Northern Europe and Western Siberia and wintering in the northern Indian Ocean. This treatment, which was adopted in *Waterbird Population Estimates* and supported by Stroud *et al.* (2004), is retained here.

Population size

1. North-western Eurasia (breeding)

Population estimate	1% threshold	Population trend
E (>1,000,000)	20,000	Unknown

The size of the Western Eurasian population is unknown, but seems certain to exceed one million individuals. Concentrations of up to 600,000 have been reported on migration at Lake Tengiz in Kazakhstan (Hayman *et al.* 1986), and over one million are thought to winter in the Arabian Sea (del Hoyo *et al.* 1996, Fry 1996). About 100,000 were recorded in one transect off southern Arabia in January 1954 (Urban *et al.* 1986). Recent estimates of breeding populations in Europe include 30,000-50,000 pairs in Iceland, 50 pairs in the Faeroes, 15-45 pairs in the U.K., 25,000-60,000 pairs in Fennoscandia, 10-100 pairs in Svalbard, and 10,000-95,000 pairs in European Russia (Thorup 2006, BirdLife International 2004a). The size of the breeding population in Western Siberia is unknown.

Conservation status

Overall trends are uncertain. Numbers may be decreasing in some southern parts of the range in Europe, but there is no evidence of any widespread decline. The breeding populations in European Russia, Norway and Svalbard are thought to be stable (BirdLife International 2004a). Until recently, the Icelandic population was thought to be stable (Koskimies 1993) or increasing slightly (Snow & Perrins 1998), but this population is now reported to be declining (BirdLife International 2004a). Finnish coastal populations fluctuate greatly, making it difficult to identify long-term trends (Tomkovich *et al.* 1997). The small marginal populations breeding in northern Scotland and north-western Ireland have shown a long-term decline, probably due to habitat loss combined with climate change (Gibbons *et al.* 1993). In Ireland, the population declined from about 50 pairs in 1905 to 10 pairs by 1970, and has disappeared in recent years (Snow & Perrins 1998, BirdLife International 2004a). The Scottish population fell from about 60 pairs in the 1920s to 45 pairs in 1970 and 20 pairs in 1988-91 (Gibbons *et al.* 1993). However, the small population in the Faeroes is thought to be stable (BirdLife International 2004a). Nothing is known of trends in the large West Siberian breeding population.

Habitat and ecology

The Red-necked Phalarope breeds in the low Arctic and sub-arctic zones, from sea level up to at least 1,300 m (Hayman *et al.* 1986). It inhabits freshwater marshes and bogs with small ponds where moss or sedge cover near the waterline provides suitable nest sites (Johnsgard 1981). It may be loosely colonial where the habitat is restricted, with up to 50 nests at one site. The northernmost populations arrive on the breeding grounds from mid-May or early June, the females often arriving ahead of the males. Temperate populations arrive on the breeding grounds some three to four weeks earlier. The species shows a low degree of site fidelity and natal philopatry (del Hoyo *et al.* 1996). A substantial proportion of the birds are already paired when they arrive on the breeding grounds. Successive polyandry is a regular feature in this species provided excess males are available (Johnsgard 1981). The sex roles are reversed, and the females take no part in incubation or caring for the young. Some females leave the breeding grounds in late June, followed by successful males in late July and juveniles in August and early September (Hayman *et al.* 1986, Boertmann 1994).

The Red-necked Phalarope is highly gregarious and mainly pelagic when not breeding, forming small to large flocks (sometimes of many thousands) at sea, often far from land. During migration, however, it regularly occurs in estuaries and bays, and also inland on ponds, lakes, open marshes and sewage works. In South-west Asia, it sometimes occurs in enormous numbers on large brackish to saline lakes during the migration seasons.

Network of key sites

A key site approach is applicable only during the migration seasons, as the species is widely dispersed on Arctic tundra during the breeding season, and almost exclusively pelagic in its winter quarters. One site in Russia, two in Kazakhstan and two in Iran have exceeded the 1% threshold on migration, as has the Arabian Sea off Oman in winter. Tengiz Lake in Kazakhstan recorded 600,000 birds in late May 1959 (Hayman *et al.* 1986) and 80,000 in 1999 (G Eichhorn *in litt.*), with 300,000 being noted in spring by Wassink & Oreel (2007). There are reports of up to a million birds on passage at the Alagol and Ulmagol complex of lakes on the Turkoman Steppe east of the Caspian in Iran (L. Cornwallis pers. com.), but details are lacking. Up to 8,000 have been recorded on spring passage in Sivash Gulf on the Sea of Azov (Chernichko *et al.* 1991).

Protection status of key sites

Lakes Alagol and Ulmagol in Iran are part of a Ramsar site designated in June 1975 and have been identified as an IBA, but are otherwise unprotected.

Table 64. Key sites for Red-necked Phalarope. Sites where 1% or more of a population has been recorded

Country	Site	Lat.	Long.	Season	Max total	Year max	Source
Iran	Lakes Alagol, Ulmagol & Ajigol	37.38	54.63	Passage	1000000	1970s	L. Cornwallis pers. com.
Iran	Lake Maharlu	29.35	52.82	April	100000	1990	Ornis Fennica 67, 1990, 141-142
Kazakhstan	Aksay water reservoir	51.18	52.97	August	20000	1989-91	calculated from Khrokov *et al.* 1998.
Kazakhstan	Tengiz - Korgalzhin lakes	50.50	69.40	Autumn	588507	2004	Schielzeth *et al.* In prep.
Oman	Arabian Sea off Oman	18.37	56.87	Non-breeding	1000000	1996	Fry 1996
Russia	Manych-Gudilo lake	46.33	42.75	Spring	50000	1969	V. Belik unpublished

Derek Scott