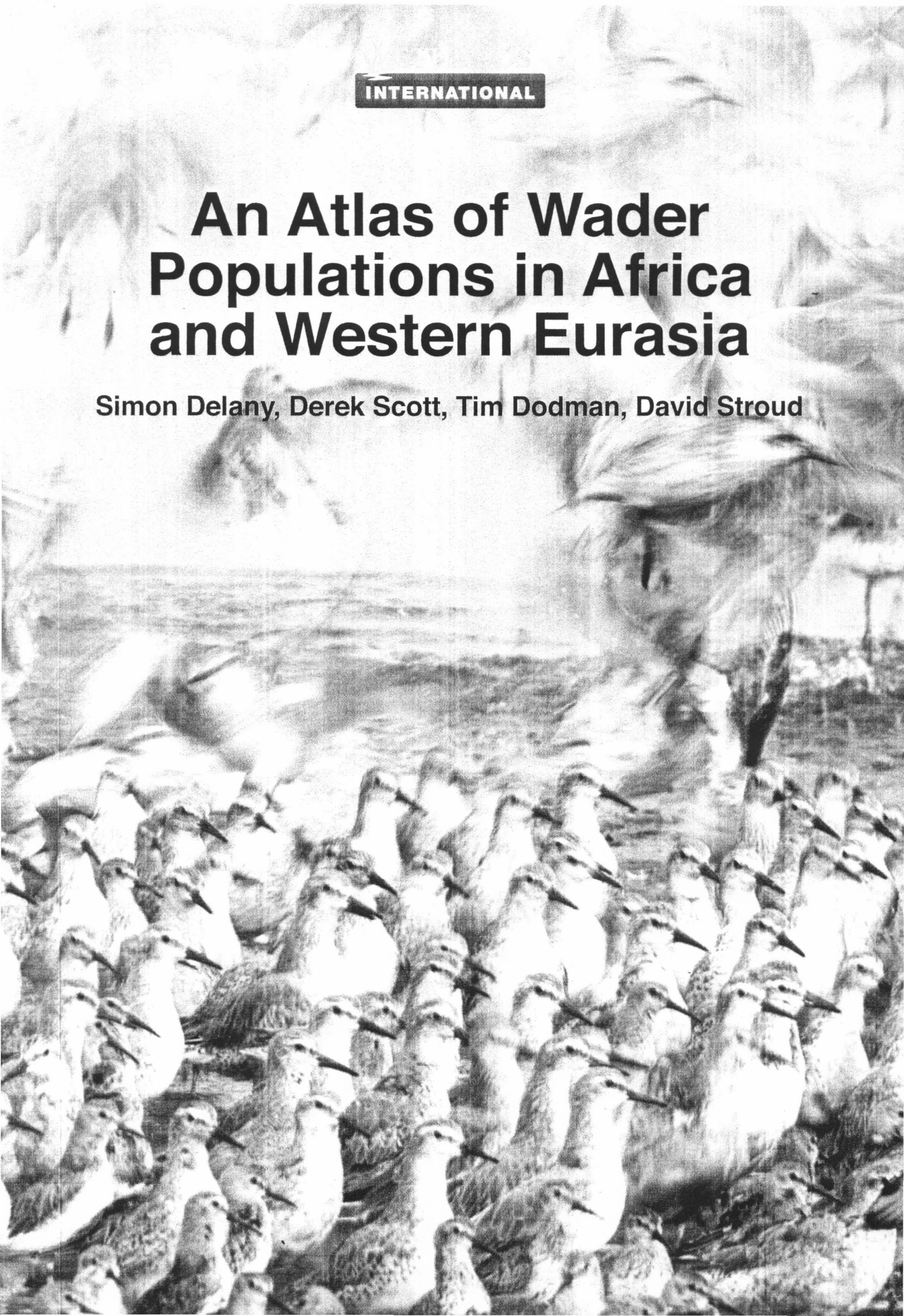

INTERNATIONAL

An Atlas of Wader Populations in Africa and Western Eurasia

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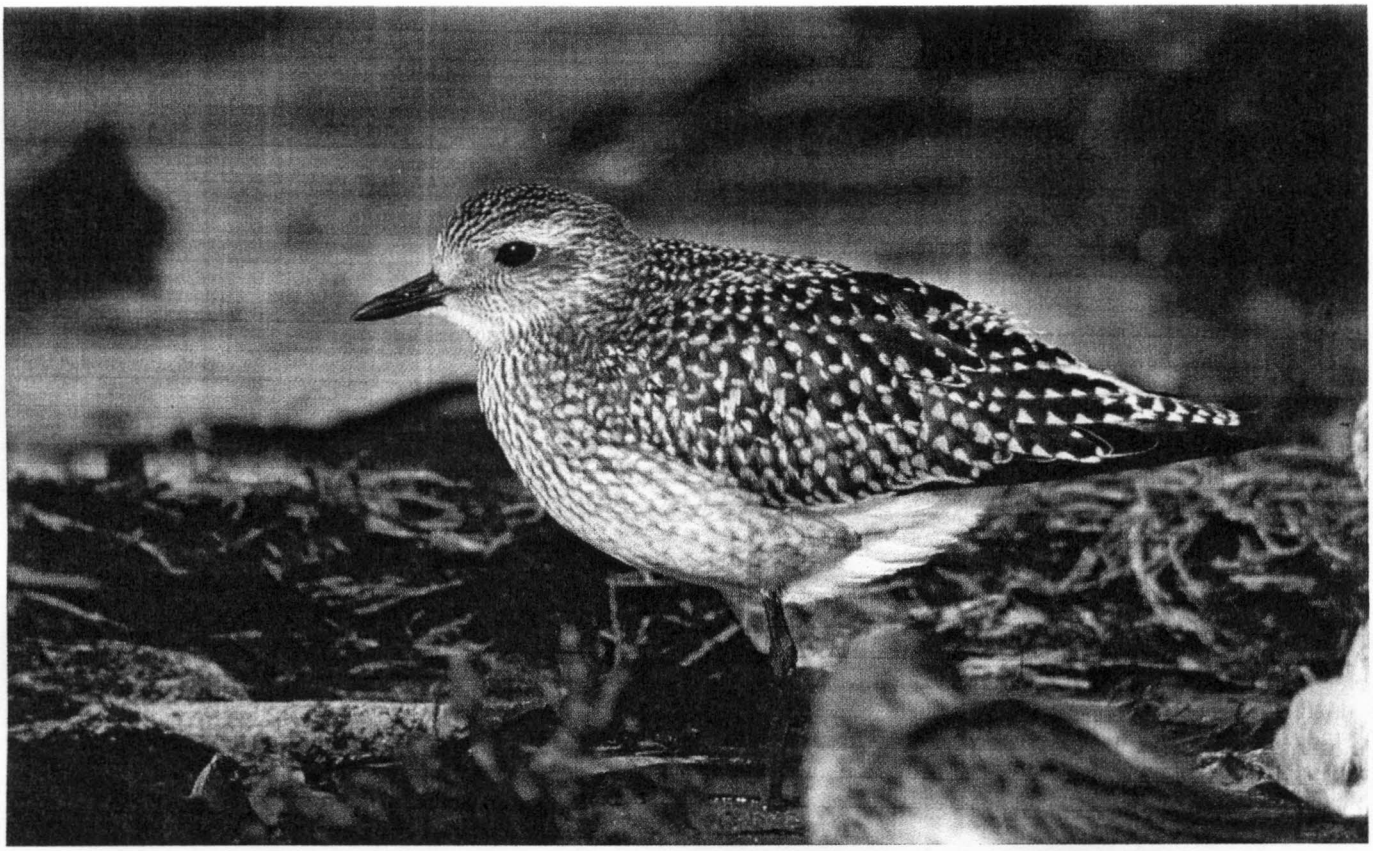


Michael Schmitz

Grey Plover *Pluvialis squatarola*

Geographical variation and distribution

The Grey Plover (or Black-bellied Plover) is a holarctic wader breeding in the tundra zones of Eurasia and North America. Most authors consider it to be a monotypic species showing some clinal variation, but Engelmoer & Roselaar (1998) resurrected the form *cynasurae* for the relatively small birds breeding in northern Canada, and have described a new subspecies, *tomkovichi*, for the relatively long-winged and short-billed birds breeding on Wrangel Island. In Eurasia, the Grey Plover breeds from the Kanin Peninsula in the west to the Chukotsky Peninsula and Anadyr Gulf in the east. Several islands, e.g. Kolguyev, Beliy, Vaigach, L'akhovskiy and Wrangel, support important numbers (Stepanyan 1990). Outside the breeding season, Eurasian breeders occur widely along coasts south to South Africa, Sri Lanka and Australasia, while North American breeders occur widely along the temperate and tropical coasts of the Americas.

In Europe, the most important wintering areas are the southern North Sea coasts (including the Wadden Sea), British estuaries and the Atlantic coast of France. Wintering sites are more scattered in the Mediterranean basin, and numbers are generally fairly low except along the Tunisian coast (c. 9,500 birds; van Dijk *et al.* 1986). Along the Atlantic coast of Africa, there are important wintering areas in Morocco, Sierra Leone and especially Mauritania, Guinea-Bissau and Guinea. In the Middle East, there are important wintering areas in Oman and Saudi Arabia. In Eastern Africa, the coasts of Tanzania and Mozambique appear to hold particularly large numbers.

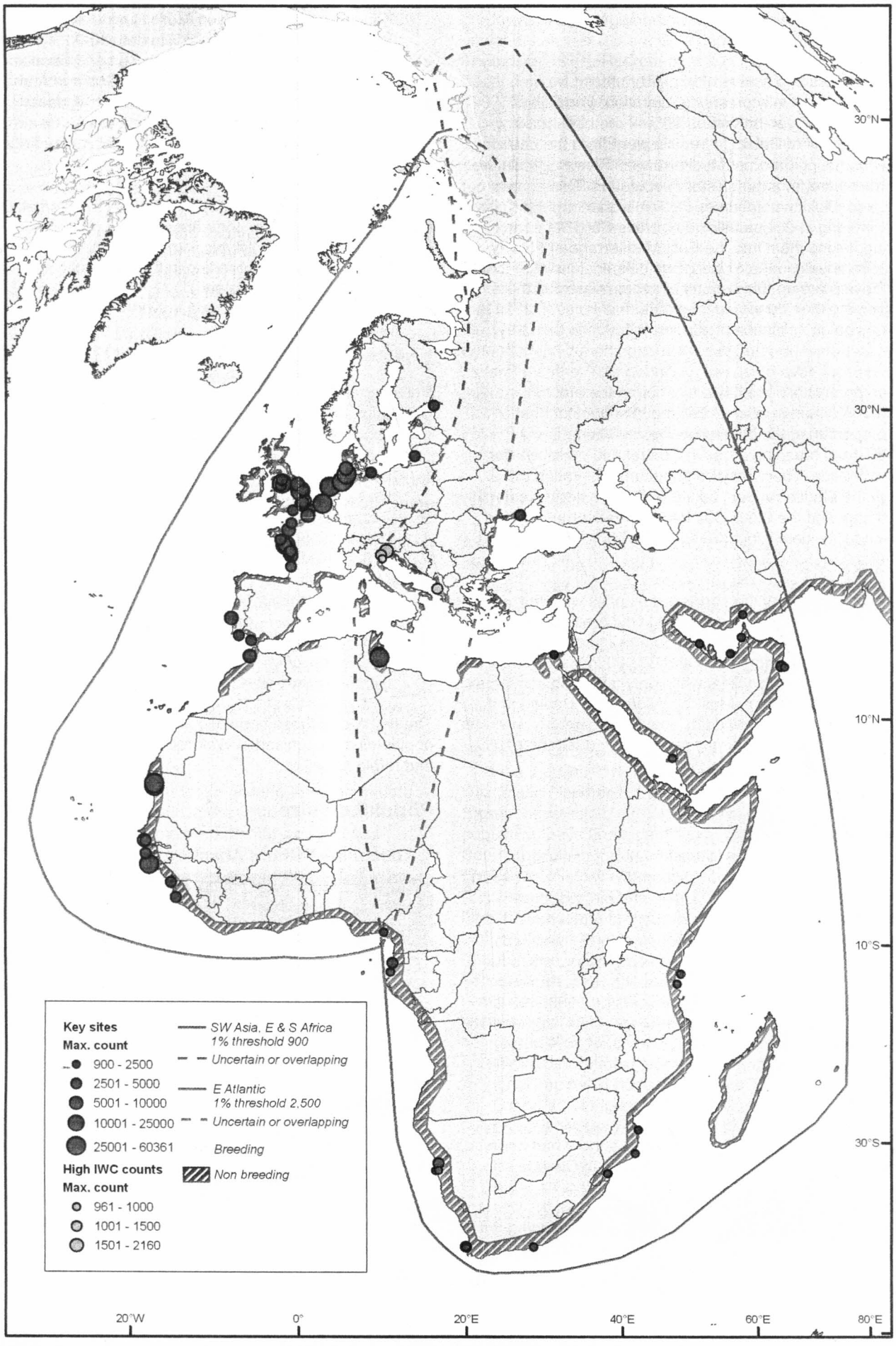
Movements

According to Mineyev (1994), there are five important autumn gathering places for the Grey Plover in the tundra of north-east European Russia which are visited by hundreds of migrants during the first half of August. Such gatherings are not apparent in the Yamal Peninsula (Danilov *et al.* 1984). In western Taymyr, at least as far east as 100°E, most birds migrate in a south-westerly direction in autumn, following the sea shore (Syroechkovski & Lappo 1994). These movements begin in July, and considerable numbers arrive in Denmark from mid-July onwards (Meltofte 1993). Although some birds begin to appear on their subtropical and tropical wintering grounds by August, the bulk of the birds seem to reach their destinations from November onwards. Birds from the westernmost part of the Siberian breeding range migrate through the Baltic and on to the Atlantic seaboard of Europe. Adults generally migrate before juveniles, which follow on a broader front (Cramp & Simmons 1983, Exo & Wahls 1996). These birds begin their main departure from North-west Africa in late April and, along with other birds wintering on the coasts of Western Europe, head for the Wadden Sea, where large numbers congregate between late April and mid/late May. As many as 140,000 birds have been counted in the Wadden Sea in mid-May (Prokosch 1988, Meltofte *et al.* 1994), with the German Wadden Sea in particular constituting an important staging area. From the Wadden Sea, the Grey Plovers continue north-east along the Baltic Sea to their Russian breeding grounds.

Birds from more easterly breeding populations seem to reach Kazakhstan, the Caspian Sea and Black Sea in non-stop flights in autumn. From there, the birds move westwards into the Mediterranean and also southwards along the East African coast, and to some extent along the Arabian and Somali peninsulas. Many of the birds reaching Southern Africa are thought to come from the Taymyr Peninsula, because breeding productivity is correlated with that of species such as the Curlew Sandpiper *Calidris ferruginea* that are known to breed there (Underhill 1997). Ringing recoveries show that the birds wintering in South Africa and Namibia follow a route through the Black Sea and eastern Mediterranean (Underhill 1997). In spring, birds taking the Mediterranean route and some birds from Eastern Africa head for staging areas in the Black and Caspian Seas. There is a diurnal migration along the Somali coastline in

Grey Plover

Pluvialis squatarola



April-May, with flights of up to 150 birds flying in V-formation at 75-150 m in height; passage is restricted to two hours in the afternoon, suggesting that direction and timing follow a schedule (Ash & Miskell 1998). Staging areas in Turkmenistan and Kazakhstan probably receive birds from Eastern Africa, as well as from wintering grounds in the Middle East.

There may be some mixing of birds from these two populations, especially on spring migration. Van Dijk *et al.* (1986) considered that about 90% of the birds passing through the Gulf of Gabès in Tunisia were from the eastern population (using the East Mediterranean Flyway), while the remainder were from the western population. This agrees with the conclusions of Grimes (1974), who thought that the birds wintering in Ghana followed a trans-Saharan route in spring, taking them into the East Mediterranean Flyway. Long-term counts in the Sivash area, Ukraine, indicate that Grey Plovers are up to seven times more numerous there during spring than during autumn (Chernichko *et al.* 1991). This may be an indication of a loop-migration in the Grey Plover.

The two populations may also mix during the autumn migration. Wymenga *et al.* (1990) have suggested that a large proportion of the birds wintering in Guinea-Bissau originate from breeding areas in Central and possibly also Eastern Siberia. There may be an autumn migration route through the Mediterranean, taking birds from north-western Kazakhstan and the Black Sea into the Mediterranean and onwards to Western Africa (Byrkjedal & Thompson 1998, M. Exo pers. com.).

In Western Europe, at the northern limit of its wintering range, the Grey Plover is sensitive to cold weather, and may undertake hard weather movements in severe winters. In mild winters, between 9,400 and 28,000 individuals are recorded in the Wadden Sea, while only a few thousand may remain in severe winters. Most birds leave the Danish and German portions of the Wadden Sea in cold winters, whereas numbers in the Dutch part may remain high (Meltofte *et al.* 1994).

Population limits

It is possible that there are at least three populations of Grey Plovers occurring on passage and in winter in Western Eurasia and Africa. Analyses of wing and bill frequency distributions from sites in both Europe and Africa have revealed the presence of three groups of birds: birds with short wings; birds with short bills and long wings; and birds with long bills and long wings (Engelmoer 1984, Prokosch 1988, Wymenga *et al.* 1990, Smit & Piersma 1989, 1994, Engelmoer & Roselaar 1998). Engelmoer (1984) argued that the short-winged birds, which make up about 10% of the birds turning up in North-west Europe, were from breeding areas in north-eastern Canada. The short-billed and long-winged birds (comprising 76%) were thought to be from Western Siberia, and the long-billed and long-winged birds (comprising 14%) from Central Siberia. As there had been no ringing recoveries linking breeding grounds in Canada with wintering areas in the East Atlantic, Smit & Piersma (1989) considered all birds wintering in Western Europe, the western part of the Mediterranean and Western Africa (including the Gulf of Guinea) as belonging to one population. In view of the uncertainties, and in the absence of any further evidence from ringing, this treatment was adopted in successive editions of *Waterbird Population Estimates*. Thus only two populations of the Grey Plover are currently recognised in Western Eurasia and Africa, both identified primarily on the basis of their distribution in the boreal winter:

1) birds wintering on the Atlantic coast of Western Europe, in the western Mediterranean and in Western Africa south to the Gulf of Guinea (as far as Nigeria); these are thought to breed mainly in Arctic Russia as far east as the Taymyr Peninsula (approximately 80-90°E);
2) birds migrating through the Black Sea and Caspian Sea, and wintering from the Persian Gulf and Arabian Peninsula south to South Africa and Madagascar (including the western coast of Southern Africa north to Cameroon); these are thought to breed mainly in Central and Eastern Siberia.

Engelmoer & Roselaar (1998) investigated the biometrics of Grey Plovers throughout their breeding range, and concluded that the species was polytypic with three subspecies:

- *P. s. squatarola* — breeding in the Palearctic and Alaska (but not on Wrangel Island);
- *P. s. cynosurae* — breeding in North Canada, east of the Mackenzie River; and
- *P. s. tomkovichi* — breeding on Wrangel Island.

Relating this taxonomy to previous considerations of population delimitation suggests the following population units should be adopted at a global scale:

- *P. s. squatarola* — birds breeding in the Western Palearctic from Kanin east to Taymyr, and wintering in the East Atlantic/Western Africa;
- *P. s. squatarola* — birds breeding in the Eastern Palearctic from Taymyr east to Chukotka, and wintering in South-west Asia and Eastern and Southern Africa;
- *P. s. squatarola* — birds breeding in western and northern Alaska, and wintering in the West Pacific;
- *P. s. cynosurae* — birds breeding in northern Canada and wintering in the West Atlantic; and
- *P. s. tomkovichi* — birds breeding on Wrangel Island (wintering area unknown).

The first two of these populations equate closely to the two populations recognised in *Waterbird Population Estimates* and retained here.

Population size

1. *squatarola* Eastern Atlantic (non-breeding)

Population estimate	1% threshold	Population trend
250,000	2,500	Decreasing

Stroud *et al.* (2004) gave a new population estimate of 247,000 based on counts and estimates from the 1990s. This figure represented a 47% increase on the previous estimate of 168,000 (Smit & Piersma 1989). However, it should be noted that some 36,900 of the new estimate came from six countries for which Smit & Piersma (1989) had no data (notably 28,000 in Guinea, 7,200 in Sierra Leone and 1,500 in Ghana). Had these numbers been available in the 1980s, Smit & Piersma's total would have been approximately 205,000 (Stroud *et al.* 2004).

2. *squatarola* South-west Asia, Eastern & Southern Africa (non-breeding)

Population estimate	1% threshold	Population trend
90,000	900	Unknown

Stroud *et al.* (2004) gave a new population estimate of 90,000 based on counts and estimates from the 1990s.

Although this was a substantial increase on the previous estimate of 50,000 (Perennou *et al.* 1994), it may still be an underestimate, since there is incomplete coverage for several countries in the Arabian Peninsula and Eastern Africa. Zwarts *et al.* (1991) found that of 260,000 waders on 200 sq.km of inter-tidal mudflats on the Gulf coast of Saudi Arabia, 7,000 (2.7%) were *P. squatarola*. Extrapolation from these data, which covered only 7% of the inter-tidal area in the Persian Gulf, might suggest that at least 60,000 Grey Plovers winter in the Persian Gulf alone. Ash & Miskell (1998) considered this to be a very common to abundant winter visitor and passage migrant to the Somali coastline.

Conservation status

There was a marked westward expansion in the breeding range in European Russia in the second half of the twentieth century (Mineyev & van Impe 1997), and the numbers wintering in North-west Europe increased substantially between the mid-1980s and mid-1990s (Stroud *et al.* 2004). However, surveys of the Banc d'Arguin in Mauritania in 1997 and 2000 found only 15,200 and 19,495, respectively, compared with 30,000 in 1980 (Zwarts *et al.* 1998, Hagemeijer *et al.* 2004), while van der Have *et al.* (1997) found a 25% decrease in the numbers wintering in the Gulf of Gabès in Tunisia between 1984 and 1994. This suggests that part of the increase in Western Europe may have been due to a northward shift in the distribution of wintering birds. More recently, a decrease has been recorded in North-west Europe and the West Mediterranean region between 1995 and 2002 (Delany *et al.* 2007), and it now appears that this population is in decline.

Very little information is available on trends in the South-west Asia/Eastern and Southern Africa wintering population. An increase was apparent in South Africa during the beginning of the twentieth century, but there is no evidence that this has continued in recent years (Underhill 1997). The increase in the population estimate given above is thus more likely to be a product of improved knowledge than of any real increase in population size.

The Grey Plover may be under some long-term threat both on the breeding grounds and in the winter quarters. In the former, the impact of the rapidly expanding oil and gas extraction activities, especially in north-eastern European Russia and on the Yamal Peninsula (Sagers 1994, Vitebsky 1990), is a topic for further research. In the Yamal Peninsula, severe weather may cause mass mortality (Evans & Pienkowski 1984, Davidson & Clark 1985). The damage and destruction of large parts of the winter habitat appears to be the most important negative factor at this season. At least 85% of British estuaries have lost at least some inter-tidal habitats through human activities (Davidson *et al.* 1992).

Habitat and ecology

In most of Eurasia, the southern limit of breeding follows that of the dwarf shrub tundra. However, in Western Siberia, breeding occurs in peat bogs in the region of the tree-line between tundra and taiga (Pokrovskaya 1999). In North America, the Grey Plover is almost totally confined to the lichen-moss zone (Byrkjedal & Thompson 1998). During migration and in winter, the highest densities are recorded on estuaries and lagoons. On the open coast, the Grey Plover prefers sheltered sandy beaches, shorelines composed of alternating rocky and sandy sections, or wave-cut rocky platforms backed by sandy beaches. On the mudflats of the Sivash area, Ukraine, brackish to hypersaline lagoons are preferred (Verkuil *et al.* 1993, Metzner & Nickel 1999). In the wooded steppe along the River Tobol in Western Siberia, migrating Grey Plovers regularly visit agricultural fields (Blinova & Blinov 1997).

While breeding, this "bold" species has an active anti-predator defence which affords protection to other species of waders as well (Larsen & Grundetjern 1997, Byrkjedal & Thompson 1998). Reproductive success, however, is largely dependent on a three-year predator/prey cycle (Potapov 1997, Ebbinge 1998). A high degree of site fidelity has been observed on the breeding grounds, and this is strongly dependent on climate and breeding density. Males are significantly more faithful to the same breeding territory than females. The return rate is much higher after a successful nesting season than after an unsuccessful one (Ryabitsev & Alekseeva 1998, Tomkovich & Soloviev 1994).

Some degree of site fidelity has also been demonstrated outside the breeding season. Individual marking has shown that some juvenile and approximately one third of the adult Grey Plovers visiting Teesmouth, north-east England, defended fixed feeding territories on inter-tidal mudflats for several months. This behaviour persisted over successive years after the first winter (Townshend *et al.* 1984, Townshend 1985). At Zwartkops Estuary, South Africa, about 65% of Grey Plovers defend feeding territories throughout the austral summer (Turpie 1995).

Network of key sites

A total of 64 key staging and wintering sites have been identified for the cosmopolitan Grey Plover, in 28 countries spread across the region. Forty three sites have been identified for the western population, spanning 18 countries from Russia and Lithuania along the Atlantic seaboard of Western Europe to Mauritania, Senegal, Guinea-Bissau and Guinea. All of these sites have held over 2,500 Grey Plovers at least once in recent years, and nine sites, the German Wadden Sea in Lower Saxony, German Wadden Sea in Schleswig-Holstein, Dutch Wadden Sea and Rhine-Maas-Schelde Delta in The Netherlands, Ribble Estuary and The Wash in the United Kingdom, Marais Breton in France, Banc d'Arguin in Mauritania, and Bijagos Archipelago in Guinea-Bissau, have held over 20,000. Key sites for the eastern population have been identified in Ukraine (1), Egypt (1), Saudi Arabia (2), Iran (1), United Arab Emirates (2), Oman (2), Tanzania (2), Mozambique (3), South Africa (3), Namibia (2) ,Gabon (2) and Cameroon (1). Counts in excess of 3,000 birds have been recorded at four of these sites: Sivash Gulf in Ukraine (maximum 5,000), Barr Al Hikman in Oman (3,300), Baie de Corisco in Gabon (3,900), and Langebaan Lagoon in South Africa (3,900). The Gulf of Gabès in Tunisia is also an extremely important site for the Grey Plover, supporting birds from both populations, especially during the spring migration when up to 16,000 birds have been recorded (van Dijk *et al.* 1986).

Protection status of key sites

Important autumn gathering places on the tundra in north-eastern Europe (Mineyev 1994) belong partly or wholly to the Nenetsky "Special Purpose" Reserve (400,000 ha), but the reserve is not totally protected from economic activity (Volkov & de Korte 1998).

Grey Plovers from the western population visit a chain of incompletely protected and unprotected estuaries in Western Europe and West Africa, which are subject to land-claim, industrial activities and human recreation. Intensive national

legalisation as well as international agreements (reviewed in de Jong *et al.* 1993) now protect the habitats of the Wadden Sea. The very important Banc d'Arguin in Mauritania and Bijagos Archipelago in Guinea-Bissau have some protection. The first has been declared a National Park, but Gowthorpe *et al.* (1996) have documented over-exploitation of offshore fisheries resources and disturbance to the entire ecosystem. UNESCO has accepted the Bijagos Archipelago as a Biosphere Reserve. Monitoring of this site was strengthened in the 1990s by a co-operative programme between the Wadden Sea States and Guinea-Bissau (Salvig *et al.* 1997).

Key sites for the eastern population are less well protected. Land-claim has resulted in permanent destruction of many inter-tidal habitats along the Saudi Arabian Gulf coast to the detriment of waterbird populations (Evans & Keijl 1993b). Protected status has been accorded here to only a few sites, e.g. Khor Dubai and Merawah Island in the United Arab Emirates. In Saudi Arabia, some protection has been given to Jubail Lagoons. Tarut Bay, also in Saudi Arabia, has been proposed as a Special Nature Reserve, Biological Reserve and Resource Use Reserve. The establishment of this protected area is one of the most pressing wildlife conservation priorities along the Gulf coast (Evans & Keijl 1993a).

Table 27. Key sites for Grey Plover. 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	Population(s) at site
Cameroon	Ndian Basin	04.50	8.75	January-March	972	2007			Van der Waarde 2007	SW Asia, E & S Africa & E Atlantic
Denmark	Wadden Sea	55.16	8.58	Spring	5373	2003	2666	2000-04 (3)	NERI, Denmark, 2005	E Atlantic
Egypt	El Malaha. Bur Fuad	31.22	32.32	Non-breeding	1540	1990			IWC database	SW Asia, E & S Africa
France	Baie de Bourgneuf et Noirmoutier	47.04	-2.12	Non-breeding	6110	1997	2787	1999-04 (5)	R Mahéo, LPO *et al.* 2005	E Atlantic
France	Baie de l'Aiguillon	46.32	-1.17	Non-breeding	2555	2001	1912	1999-04 (5)	IWC database	E Atlantic
France	Baie des Veys et Pointe d'Arçay	49.40	-1.14	Non-breeding	3401	1997	1348	1999-04 (5)	IWC database	E Atlantic
France	Baie du Mont Saint Michel	48.67	-1.51	Non-breeding	7200	2001	4329	1999-04 (5)	IWC database	E Atlantic
France	Bassin d'Arcachon et Banc d'Arguin	44.67	-1.12	Migration	3000	1997			WBDB	E Atlantic
France	Côtes Nord et Ouest de l'Ile d'Oleron	45.97	-1.47	Non-breeding	3429	1992	486	1999-03 (5)	IWC database	E Atlantic
France	Golfe du Morbihan	47.56	-2.79	Wintering	2600	1998	2113	1999-03 (5)	R Mahéo, LPO *et al.* 2005	E Atlantic
France	Ile de Ré	46.22	-1.50	Non-breeding	2572	2000	1560	1999-04 (5)	IWC database	E Atlantic
France	Littoral Picard	50.23	1.50	Non-breeding	5053	1996	323	1999-04 (5)	IWC database	E Atlantic
France	Marais Breton	46.97	-2.00	Non-breeding	12532	2001	4180	2001-03 (3)	IWC database	E Atlantic
France	Réserve Naturelle de Moeze (Charente-Seudre)	45.83	-1.14	Non-breeding	5943	2000	3320	1999-04 (5)	IWC database	E Atlantic
Gabon	Baie de Corisco	1.20	9.67	Feb-Mar	3900	1992			AfWC database	SW Asia, E & S Africa
Gabon	Estuaire du Gabon	0.21	9.42	Feb-Mar	1176	1992			AfWC database	SW Asia, E & S Africa
Germany	Wadden Sea - Lower Saxony	54.00	8.00	Spring	58036	1993	25679	1998-02 (5)	J . Blew, CWSS, 2005	E Atlantic
Germany	Wadden Sea - Schleswig-Holstein	54.50	8.50	Autumn	46812	1992	20458	1997-01 (5)	J . Blew, CWSS, 2005	E Atlantic
Germany	Western Pomerania Coast	54.43	12.90	Autumn	3200				Graumann 2007	E Atlantic
Guinea	Vasières de Sonfonia	9.67	-13.56	Non-breeding	2876	2000	2738	1999-00 (2)	AfWC database	E Atlantic
Guinea-Bissau	Bijagos Archipelago	11.30	-16.00	January	39100	1993	32600	1992-01 (3)	Dodman & Sá 2005	E Atlantic
Iran	Rud-i-Shur, Rud-i-Shirin & Rud-i-Minab Deltas	27.08	56.75	January	1130	2005	652	2004-07 (3)	DOEI / WIWO Svazas *et al.* 1999	SW Asia, E & S Africa
Lithuania	Nemunas river delta	55.30	21.33	August	4500	1996				E Atlantic
Mauritania	Banc d'Arguin	20.12	-16.27	January	19500	2000	17660	1997-01 (3)	Hagemeijer *et al.* 2004	E Atlantic
Morocco	Merja Zerga: Kenitra	34.80	-6.30	Winter	5260	1990	2365	1990-95 (5)	IWC database	E Atlantic
Mozambique	Bay Inhambane	-24.18	35.38	July-August	2070	1999			AfWC database	SW Asia, E & S Africa

Country	Site	Lat.	Long.	Season total	Max max	Year total	Average for	Basis average	Source	Population(s) at site
Mozambique	Bazaruto, Benguera and Magaruque Is	-21.50	35.43	Non-breeding	2029	1997	1552	1996-98 (3)	Köhler & Köhler *in litt*	SW Asia, E & S Africa
Mozambique	Inhaca Island	-26.00	32.62	No data	900	1995			Parker 1999	SW Asia, E & S Africa
Namibia	Sandwich Harbour	-23.38	14.48	July-August	1207	1999	394	1992-00 (5)	AfWC database	SW Asia, E & S Africa
Namibia	Walvis Bay Ramsar Site	-22.50	14.42	July-August	2598	1999	1061	1991-99 (4)	AfWC database	SW Asia, E & S Africa
Netherlands	Rhine-Maas-Schelde Delta	51.50	4.00	Autumn	13540	1995	9542	1999-03 (5)	RWS WD RIKZ 2005	E Atlantic
Netherlands	Wadden Sea	53.30	5.38	Spring	60361	2004	50411	1999-03 (5)	SOVON, The The Netherlands	E Atlantic
Oman	Barr Al Hikman	20.63	58.47	Non-breeding	3300	1997	1310	1993-01 (5)	IWC database	SW Asia, E & S Africa
Oman	Masirah Island	20.42	58.78	October	1600	1992			Evans, 1994	SW Asia, E & S Africa
Portugal	Estuário Do Tejo	38.75	-9.08	Non-breeding	6836	1989	2415	1996-01 (5)	IWC database	E Atlantic
Portugal	Ria De Faro	37.00	-7.92	Non-breeding	3028	1995	513	1997-01 (5)	IWC database	E Atlantic
Russia	Seskar Island	60.02	28.40	Migration	3000	1997	2500	1997	Skov *et al.* 2000	E Atlantic
Saudi Arabia	Jizan Beach	16.88	42.53	Non-breeding	2232	1992	653	1991-96 (5)	IWC database	SW Asia, E & S Africa
Saudi Arabia	Tarut Bay	26.67	50.17	Non-breeding	1708	1993	1102	1993-96 (3)	IWC database	SW Asia, E & S Africa
Senegal	Casamance delta	12.43	-16.48	December	4000	1985-87	3500	1985-87	R Mahéo *in litt*	E Atlantic to P. Yésou
Senegal	Parc National du Delta du Saloum	13.83	-16.75	Non-breeding	5539	1999	3185	1973-99 (4)	AfWC database	E Atlantic
Sierra Leone	Yawri Bay	8.20	-12.92	January-Feb	2684	2005			Van der Winden *et al.* 2007	E Atlantic
South Africa	Langebaan Beach	-33.13	18.07	Pre-breeding migration	1860	1998			AfWC database	SW Asia, E & S Africa
South Africa	West Coast National Park	-33.08	18.10	Non-breeding	3915	1999			AfWC database	SW Asia, E & S Africa
South Africa	Zwartkops River Estuary	-33.87	25.63	Non-breeding	914	1994			AfWC database	SW Asia, E & S Africa
Spain	Cádiz Bay	36.53	-6.27	Non-breeding	2624	1996	1227	1996-01 (5)	IWC database	E Atlantic
Tanzania	Pemba Island	-5.17	39.67	January	2150	1998			Geene, 2001	SW Asia, E & S Africa
Tanzania	Zanzibar Island	-6.13	39.23	January	2388	1998			Geene, 2001	SW Asia, E & S Africa
Tunisia	Gulf of Gabès	34.40	10.32	February	16790	1984			Van Dijk *et al.* 1986	E Atlantic + SW Asia, E & S Africa
Ukraine	The Sivash, Azov Sea	46.17	34.58	Spring	5000	1992			van der Winden *et al.* 1993	SW Asia, E & S Africa
U.A.E.	Khor Dubai	25.21	55.33	Non-breeding	1000	1992	394	1995-99 (5)	Evans, 1994	SW Asia, E & S Africa
U.A.E.	Merawah Island	24.33	53.25	Non-breeding	932	1995	587	1994-98 (4)	IWC database	SW Asia, E & S Africa
U.K.	Alt Estuary	53.52	-3.05	Spring	4890	1997-02	3214	1997-02 (5)	BTO, UK, 2005	E Atlantic
U.K.	Blackwater Estuary	51.72	0.80	Winter	4649	1999-03	2992	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	Chichester Harbour	50.80	-0.93	Winter	3180	1999-03	2144	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	Dengie Flats	51.68	0.93	Winter	7826	1999-03	4144	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	Hamford Water & the Naze	51.88	1.23	Winter	3267	1999-03	2494	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	Humber Estuary	53.67	-0.17	Spring	6135	1997-02	2742	1997-02 (5)	BTO, UK, 2005	E Atlantic
U.K.	Medway Estuary	51.40	0.65	Winter	3221	1999-03	1990	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	North Norfolk Coast	52.98	0.76	Autumn	2890	1999-03	2104	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	Ribble Estuary	53.72	-2.92	Spring	16395	1997-02	7922	1997-02 (5)	BTO, UK, 2005	E Atlantic
U.K.	Stour Estuary	51.93	1.15	Winter	3739	1999-03	3188	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	Thames Estuary	51.48	0.57	Winter	6923	1999-03	4939	1999-03 (5)	BTO, UK, 2005	E Atlantic
U.K.	The Wash	52.93	0.30	Spring	16112	1997-02	13514	1997-02 (5)	BTO, UK, 2005	E Atlantic