

African-Eurasian Flyways

Origin and movements of Grey Plovers *Pluvialis squatarola* ringed in Germany

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The general migration routes of waders using the East Atlantic flyway are reasonably well known. However, detailed studies on the migration routes and the origin of Grey Plovers staging along the German coasts are very limited. We analyzed unpublished recoveries of birds ringed by the schemes of the *Vogelwarte Hiddensee* and the *Vogelwarte Helgoland*. A total of 2 896 Grey Plovers ringed in the period 1909-1994 resulted in 44 recoveries. Of these, 22 could be used for further analyses.

The recoveries indicate that Grey Plovers passing along the German coasts originate from arctic Russia. The wintering area ranges from north-east Scotland to the Gulf of Guinea. Grey Plovers wintering in Britain may leave the Wadden Sea later than birds wintering further south. Two recoveries from Tunisia and Egypt indicate that some of the birds switch over to a more easterly route, in particular young birds may migrate on a wider front. Though the majority of birds were ringed at the Baltic coast there is no direct evidence that first calendar year birds staging at the Baltic coast on their first autumn passage migrate step-by-step and stop over in the Wadden Sea again to fill up their energy reserves.

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INTRODUCTION

The East Atlantic flyway population of Grey Plovers has increased considerably over the last decades (Meltofte *et al.* 1994; Rösner *et al.* 1994; Cayford & Waters 1996). Based upon count data Meltofte *et al.* (1994) estimated a total of at least 166 000 birds. Almost the entire East Atlantic flyway population uses the Wadden Sea in May to build up body reserves for their further flights to the breeding grounds. The majority of the population passes through the Wadden Sea again in autumn. In mild winters more than 10% of the flyway population may winter in the Wadden Sea (Prokosch 1988; Meltofte *et al.* 1994). Therefore, the Wadden Sea is of outstanding international importance to the East Atlantic flyway population of Grey Plovers. However, during autumn passage a considerable number of Grey Plovers, especially first calendar year birds, use the Baltic coast as a staging area.

While the general migration routes of waders are reasonably well known, detailed studies on the origin and migration routes of Grey Plovers are very limited. Grey

Plovers are typical long-distance migrants. Those birds migrating through the Wadden Sea are assumed to originate from breeding grounds in arctic Russia, eastwards to about 80° E (Taimyr peninsula, Cramp & Simmons 1983). The wintering areas of these birds reach as far south as to the Gulf of Guinea (Branson & Minton 1976; Cramp & Simmons 1983).

The aim of this short contribution is to supply some more details on migration patterns by making still unpublished recovery data of Grey Plovers ringed by the schemes of the *Vogelwarte Hiddensee* and the *Vogelwarte Helgoland* available. At least some of the recoveries ringed by other European ringing schemes have been published elsewhere (*e.g.* Branson & Minton 1976; Pienkowski & Evans 1984; Prokosch 1988; Meltofte 1993). Ringing recoveries are an important tool in depicting migration patterns.

RINGING AND RECOVERY TOTALS

A total of 2 896 Grey Plovers were ringed in Germany by the end of 1993 (Hiddensee 1964 - 1993: 1 481, Helgoland 1909 - 1993: 1 415). Up to the beginning of 1995 the 2 896 ringings had resulted in 44 recoveries (Hiddensee: 32, Helgoland: 12). Controls (retraps, resightings *etc.*) near the ringing site during the same season are not considered. The overall recovery rate for both schemes is about 1.5%. The recovery rate of birds ringed by the scheme of Hiddensee, mainly along the German Baltic coast is higher than of birds ringed with Helgoland rings, prevailingly in the Wadden Sea (2.2% vs. 0.9%). Most of the birds recovered were ringed in the 1980s (1955-79: 10, 1980-89: 30, 1990-94: 4).

About 86% (38 of 44) of the birds recovered were ringed during autumn migration, from August to October (Table 1). The majority of these birds (84%, 32 of 38) were ringed at the German Baltic coast, mainly on the island of Langenwerder (54°2' N, 11°30' E, district of Rostock). From those 38 ringings, 25 birds (66%) were caught as first calendar year birds, 24 (63%) of them at the Baltic coast on autumn passage. There are only five (11%) recoveries of birds ringed during spring passage in May. According to their seasonal occurrence (see above) these birds were caught in the German Wadden Sea.

Table 1. Numbers of Grey Plovers ringed by German ringing schemes and recovered by the end of 1993. The data are split according to the ringing region, season and age at ringing.

Ringing region	Autumn		Spring		Total
	first year	full grown	full grown	breeding adult	
German Baltic coast	24	8			32
German Wadden Sea	1	5	5		11
Taimyr				1	1
Total	25	13	5	1	44

For the evaluation different ringing activities during spring and autumn migration as well as different ringing activities in both areas have to be taken into account. However, both (1) the total number of birds ringed in both areas on spring and autumn passage, respectively, as well as (2) the number of first calendar year birds ringed along the Baltic coast and in the Wadden Sea, respectively, correspond with the count data. Grey Plovers as most other waders use the Baltic coast as a stop over site almost exclusively during autumn migration, whereas on spring passage only very small numbers rest there (Kube & Struwe 1994). Furthermore, a much higher proportion of juveniles than of adult birds uses the Baltic Sea as a staging site. Similarly, the number of ringed and recovered juveniles was much higher in the Baltic.

ORIGIN AND MIGRATION

Ringling recoveries must be analyzed and interpreted with great caution (*e.g.* Perdeck 1977; Busse 1986; North 1987). For example, the recovery probability in different areas is severely biased by hunting, observation and/or ringing as well as reporting activities of man. According to the finding circumstances the recoveries were grouped into two categories: 'found dead' and 'hunted' (EURING codes 10, 11 and 19). As Figure 1 indicates, the distribution differs markedly according to the finding circumstances. Half (22) of all birds recovered were shot, about 91% (20) of these in France. Therefore, we excluded all birds recovered as 'hunted' or otherwise killed by man from the general analysis, exceptions are mentioned. As in most species the distribution and migration patterns are represented best by the category 'found dead'. However, the category 'found dead' may also include some birds whose death was in fact caused by hunting. In addition to the 15 birds reported as 'found dead' seven controls are included in the analyses. Therefore, a total of 22 recoveries could be used for further analyses. According to the age of ringing these recoveries were grouped into two age classes (a) first calendar year birds ringed during their first autumn (13 recoveries), and (b) birds older than first calendar year (nine).

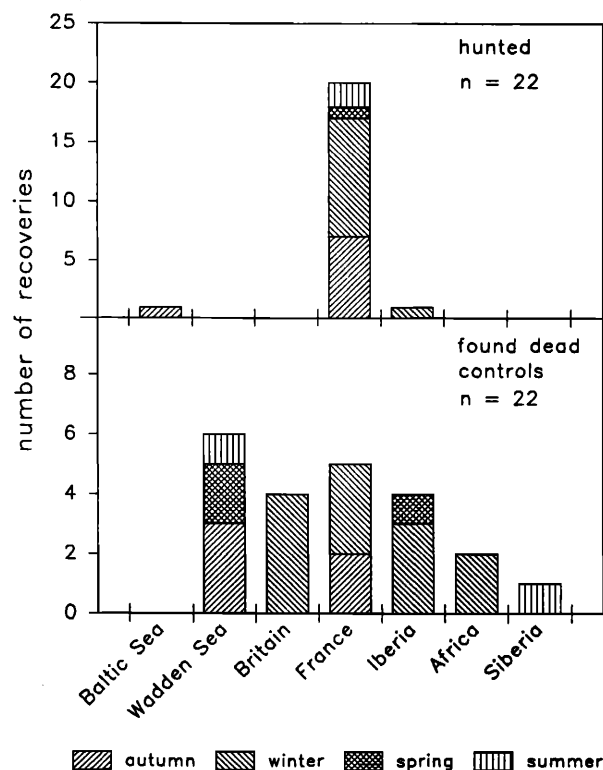


Figure 1. Recovery numbers of Grey Plovers ringed in Germany split according to recovery regions, the season of recovery and the recovery circumstances: (a) shot, (b) found dead/controls. Note the different scales. n - number of recoveries; autumn: August - October, winter: November - February, spring: March - May, summer: June/July.

The recoveries of Grey Plovers ringed on their passage through Germany confirm the common view that most of them follow a migration route along the East Atlantic flyway. One male bird that was ringed in the Wadden Sea during spring migration and controlled on the Yamal Peninsula (Figure 2b) gives further evidence that Grey Plovers passing along the German coast originate from arctic Russia. So does one colour-ringed female which was ringed during incubation on Yamal Peninsula in July 1993 and seen on several occasions in the East Frisian Wadden Sea during spring and autumn migration 1993 to 1995 (pers. obs.). Branson & Minton (1976) and Meltofte (1993) mentioned three further recoveries of birds ringed in Europe and found at Siberian breeding grounds.

The winter recoveries from Britain, France, the Iberian peninsula, the Canary islands, Gabun, Tunisia and Egypt (Figure 2a, b) indicate that the wintering area of Grey Plovers passing along the German coasts ranges from north-east Scotland in the north down to the Gulf of Guinea/Gabon in the south.

Whereas some birds just pass over to the North Sea in order to winter in Britain, the majority seem to migrate further south to African winter quarters. There are no recoveries reported from Britain before December, whereas recoveries from more southerly areas, e.g. France turn up from August onwards (Figure 2a, b). This may indicate that Grey Plovers wintering in Britain may leave the Wadden Sea relatively late, whereas birds migrating further south start earlier (c.f. Townshend 1982; Cramp & Simmons 1983; Meltofte 1993). Including the birds recovered as 'hunted' Grey Plovers seem to arrive in France from end of August onwards.

At least some of the birds wintering in Britain use the Wadden Sea as a staging site during spring and autumn migration (Figure 2b; c.f. Branson & Minton 1976; Pienkowski & Evans 1984; Prokosch 1988). According to the recoveries given by Branson & Minton (1976) some of the birds wintering in Britain stop over at the Swedish Baltic coast. However, until now it is uncertain whether these birds migrate via the Baltic coast without resting in the Wadden Sea or if they migrate step-by-step. Including the birds recovered as 'hunted' there is only one recovery from the Swedish Baltic coast of a Grey Plover ringed in the German Wadden Sea (Figure 1). Furthermore, it is uncertain whether first calendar year birds using the Baltic coast as a staging site on their first autumn passage stop over in the Wadden Sea again to fill up their body reserves before migrating further south or fly directly to their wintering sites. Though there is no direct evidence based on recoveries, it is assumed that juvenile birds migrate step-by-step, whereas most adults make non-stop flights from the Wadden Sea to their breeding and wintering grounds, respectively (c.f. Glutz von Blotzheim *et al.* 1975).

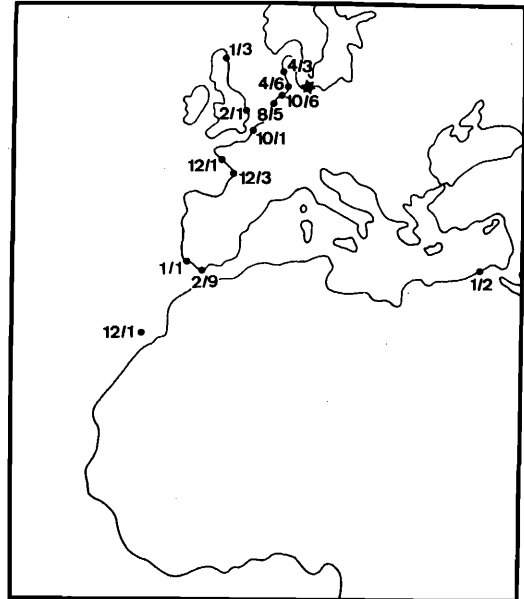


Figure 2. Ringing (*) and recovery (●) places of Grey Plovers ringed in Germany. The first number beside each symbol indicates the month of recovery and the second number (only in 2 a) the year of life. (a - upper) birds ringed on their first autumn passage. (b lower) sum of all other age classes. Additionally, the place of one male (♦) captured and retrapped a year later on the breeding grounds on Taimyr Peninsula (Pjasina Delta; DFH 6326001) as well as the breeding place of one female (σ) colour-ringed on Yamal peninsula and observed in the East Frisian Wadden Sea are indicated.

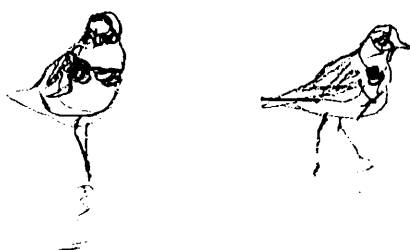
However, two recoveries from Tunisia and Egypt indicate that at least some of the birds staging in Germany switch over to a more easterly route. These recoveries correspond with the morphometrical analyses of birds wintering in Tunisia (van Dijk *et al.* 1986). According to van Dijk *et al.* (1986) a small proportion of Grey Plovers wintering in Tunisia belongs to the west Palearctic breeding population, whereas the majority is of east Palearctic origin, breeding east of Taimyr. It is assumed that a small number of Grey Plovers migrate along the Mediterranean flyway with staging sites at the Black Sea and Caspian Sea area (Branson & Minton 1976; Summers & Waltner 1979; Wymenga *et al.* 1990). Birds wintering in South Africa are believed to migrate via the Great Circle route (Summers & Waltner 1979). The recovery of a bird ringed at the German Baltic coast in Egypt in its first winter gives further evidence that especially young birds migrate on a wide front (*c.f.* Cramp & Simmons 1983).

CONCLUDING REMARKS

The restricted number of German recoveries preclude detailed analyses of the recovery patterns and migration routes (*e.g.* age and sex specific analyses, migration patterns of different populations, analyses of hard weather movements *etc.*). The recoveries correspond well with recoveries from other European countries (*c.f.* Branson & Minton 1976; Pienkowski & Evans 1984; Meltofte 1993) as well as with count data. However, our present knowledge about the migration patterns of Grey Plovers is limited. Therefore, it seems to be worth to carry out comprehensive analyses of the data stored in the EURING data bank. About 400 - 450 recoveries are actually stored there (Wassenaar *pers. comm.*).

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REFERENCES

- Branson, N.J.B.A. & Minton, C.D.T. 1976. Moulting, measurements and migrations of the Grey Plover. *Bird Study* 23: 257-266.
- Busse, P. 1986. Theoretical models in an interpretation of recovery patterns. *Ring* 11: 211-228.
- Cayford, J.T. & Waters, R.J. 1996. Population estimates for waders *Charadrii* wintering in Great Britain, 1987/88-1991/92. *Biol. Conserv.* 77: 7-17.
- Cramp, S. & Simmons, K.E.L. 1983. *The birds of the Western Palearctic*. Vol. III, Oxford Univ. Press, Oxford.
- Glutz von Blotzheim, U.N., Bauer, K.M. & Bezzel, E. 1975: *Handbuch der Vögel Mitteleuropas*. Vol. 6/1, Wiesbaden.
- Kube, J. & Struwe, B. 1994. Die Ergebnisse der Limikolenzählungen an der südwestlichen Ostseeküste 1991. *Corax* 15, Special Issue 2: 4-56.
- Meltofte, H. 1993. [Wader migration through Denmark: populations, non-breeding phenology and migratory strategies.] *Dansk Orn. Foren. Tidsskr.* 87: 1-180. (In Danish).
- Meltofte, H., Blew, J., Frikke, J., Rösner, H.-U. & Smit, C.J. 1994. Numbers and distribution of waterbirds in the Wadden Sea. Results and evaluation of 36 simultaneous counts in the Dutch - German - Danish Wadden Sea 1980-1991. *IWRB Publication 34 / Wader Study Group Bull.* 74, Special Issue.
- North, P.M. 1987. Ringing recovery analytical methods. *Acta Ornithologica* 23: 1-175.
- Perdeck, A.A. 1977. The analysis of ringing data: pitfalls and prospects. *Vogelwarte* 29: 33-44.
- Pienkowski, M.W. & Evans, P.R. 1984. Migratory behaviour of shorebirds in the Western Palearctic. In: Burger, J. & Olla, B.L. (eds). *Behaviour of marine animals*. Vol. 6: 92 - 103. Plenum Press, New York.
- Prokosch, P. 1988. Das Schleswig-Holsteinische Wattenmeer als Frühjahrs-Aufenthaltsgebiet arktischer Watvogelpopulationen am Beispiel von Kiebitzregenpfeifer (*Pluvialis squatarola*, L. 1758), Knutt (*Calidris canutus*, L. 1758) und Pfuhlschnepfe (*Limosa lapponica*, L. 1758). *Corax* 12: 273-442.
- Rösner, H.U., van Roomen, M., Südbek, P. & Rasmussen, L.M. 1994. Migratory waterbirds in the Wadden Sea 1992/93. *Wadden Sea Ecosystem* No. 2, Common Wadden Sea Secretariat & Trilateral Monitoring and Assessment Group, Wilhelmshaven.
- Summers, R.W. & Waltner, M. 1978. Seasonal variations in the mass of waders in southern Africa, with special reference to migration. *Ostrich* 50: 21-37.
- Townshend, D.J. 1982. The Lazarus syndrome in Grey Plovers. *Wader Study Group Bull.* 34: 11-12.
- Van Dijk, A.J., van Dijk, K., Dijkse, L.J., van Sopanje, T.M. & Wymenga, E. 1986. *Wintering waders and waterfowl in the Gulf of Gabes, Tunisia, January-March 1984*. WIWO report No 11, Zeist.
- Wymenga, E., Engelmoer, M., Smit, C.J. & van Spanje, T.M. 1990. Geographical breeding origin and migration of waders wintering in West Africa. *Ardea* 78: 83-112.