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SHORT NOTE

Expansion of the Mediterranean Gull *Larus melanocephalus* in Poland

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Abstract Since 1981, when the first breeding pair of Mediterranean Gull *Larus melanocephalus* was recorded in Poland, the population of this gull has increased considerably. Its population size was stable until 1997, not exceeding ten pairs annually; thereafter, an increasing number of sightings were made, and during the last 5 years between 26 and 39 breeding pairs have been recorded in Poland. To date, breeding sites have been established in a total of 45 sites (maximum of 19 sites in a given year), with 27% of these (43% of all broods) found on islands located in the middle course of the Vistula River. Breeding sites have also included artificial reservoirs, such as dam reservoirs (20% of sites, 19% of broods), gravel pits (9% of sites, 13% of broods) and fishponds (24% of places, 8% of broods). Mediterranean Gulls were found to nest only within the colonies of other Laridae. Single pairs were recorded at 40% of the breeding sites, whereas a maximum of two to five pairs were recorded at 47% of the other sites. The great majority of breeding attempts were recorded in Black-headed Gull *L. ridibundus* colonies. In two cases, Mediterranean Gulls bred within mono-specific colonies of Common Gulls *L. canus* consisting of 60–150 pairs. The biggest concentrations of breeding sites were along the middle course of the Vistula river and in the southern part of Poland.

Keywords Distribution · Habitat selection · *Larus melanocephalus* · Mediterranean Gull · Population dynamics

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Introduction

The Mediterranean Gull *Larus melanocephalus* is a relatively new breeding species in Central and Western Europe. Until the 1940s and the beginning of the 1950s its breeding range was almost entirely confined to the northwestern (NW) coast of the Black Sea (Ardamatskaya 1999), where the population reached its peak – 336,000 pairs – in 1983 (Rudenko 1999). Beginning in the 1950s and 1960s, the Mediterranean Gull started to expand its range to the west and the northwest, thereby expanding into many countries of Central and Western Europe (Gibbons et al. 1993; Bekhuis et al. 1997; Meininger and Flamant 1998; Boschert 1999; Chytil 1999; Sadoul and Raevel 1999; Winkler 1999; Boschert 2002). The most northern breeding attempt that has been recorded, occurred in Estonia in 1962 and 1967 (Leibak et al. 1994).

We describe here the expansion of the Mediterranean Gull in Poland since the 1980s, including observations on population dynamics, distribution and breeding habitat preferences.

Methods

The data analysed cover a period from 1981 to 2005 and are based on confirmed and probable breeding records, collected by the authors or the other observers and published in annual rarities reports. Between 2000 and 2005, the authors monitored 18 of all 45 known breeding sites.

All confirmed breeding attempts were verified by the Rarities Committee and refer to observations/records of a nest with eggs or chicks or of incubating adult Mediterranean Gulls. A number of records include cases in which broods were not found by the observer but instead an adult Mediterranean Gull or a subadult (ready to breed) (Cramp and Simmons 1983) was observed in the colony in May or June on at least two different days separated by a 1-week interval or more and which showed behaviours such as territory defence, displaying, copulation, anxiety or landing in the same place.

Up to and including 1999, all records of Mediterranean Gulls in Poland had to be verified by the Polish Rarities Committee. Since 2000, only breeding records have been verified, and the majority of probable breeding attempts have not been reported to the Rarities Committee. However, after receiving additional data from the observers, we considered these sightings as valuable and included them in our study.

Since 2000, potential new breeding sites of Mediterranean Gulls in many Black-headed Gull *L. ridibundus* colonies in the Vistula river valley and in southern Poland have been intensively monitored. These included reservoirs on islands of the Vistula River which have numerous colonies of the Black-headed Gull as well as other locations where Mediterranean Gulls had bred in the previous years. To find locate the nests, we carried out long-term observations of the colonies with binoculars or a spotting scope from different sites – from the bank of the reservoir or from a boat. Mediterranean Gull eggs were identified according to their colour, size and shape (Makatsch 1974; Cramp and Simmons 1983; Nawrocki and Wesołowski 1984). The nestlings were identified on the basis of the colouration of their down and the structure and colour of the naked parts of their body (Fjeldsa 1977; Nawrocki and Wesołowski 1984). Nests were marked and checked from the distance if they really determined to be occupied by Mediterranean Gulls.

Results

First records of non-breeding birds

The first official recording of Mediterranean Gulls in Poland was in 1900 and 1905, when two single individuals were observed near Gdansk (northern Poland) (Dobbrick 1931). In 1949 and 1950 two dead individuals, ringed in the Black Sea region, were found on the Polish Baltic coast (Szczepski and Szczepska 1956). The first recordings of Mediterranean Gulls penetrating inland in Poland were in 1956, 1960 and 1963 (Ruprecht 1987; Tomiałojć 1990).

Between 1971 and 1980, Mediterranean Gulls were recorded 21 times in Poland, but only two records of single individuals fell within the breeding season (Tomiałojć 1990). Records of non-breeding birds continued to be rare up to the end of the 1980s, which was confirmed by the small number of observations verified and accepted by the Polish Rarities Committee (five to ten annually, excluding records at breeding sites).

Population dynamics

The first breeding Mediterranean Gull pair in Poland was recorded in 1981 on the Vistula Lagoon (Nitecki 1984). In 1982, new breeding sites of Mediterranean Gulls were observed on the islands of the middle course of the Vistula River, within two colonies of Common Gulls *L. canus*: three nests were found in one colony and, in the second colony, 2 km away, one pair of intensively disturbed adult birds was observed (Nawrocki and Wesołowski 1984). Up to 1997, the number of breeding sites varied and the number of total breeding pairs never exceeded ten annually, including both confirmed and probable breeding records. Since 1998, however, the number of breeding sites has increased, and during the last 5 years the number of Mediterranean Gull breeding pairs has been estimated at 26–39 pairs (Fig. 1).

Distribution

As of 2005, breeding was confirmed at 33 sites, and probable breeding was recorded at another 12 sites. These breeding sites were distributed throughout Poland, but mainly in the river valley of the middle course of the

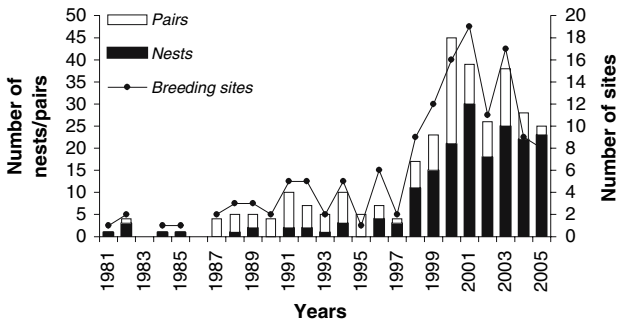

Fig. 1 The number of breeding pairs and breeding sites of the Mediterranean Gull *Larus melanocephalus* in Poland, 1981–2005

Vistula River and in the southern part of the country (Fig. 2). At the beginning of the colonization of Poland, Mediterranean Gulls mainly occupied the middle course of the Vistula (Fig. 2), where in the 1980s and the early 1990s many numerous colonies of Black-headed Gulls and Common Gulls were found. The number of breeding sites in the southern part of Poland has increased significantly from the late 1990s onwards.

Habitat choice

The majority of the Mediterranean Gull breeding sites were located along the unregulated section of the Vistula river, on natural islands in the course of the river. Other readily occupied water reservoirs include fishponds, dam reservoirs and man-made gravel pits (Table 1). Although colonies on the river represented 27% of all known breeding places, 43% of all breeding records were made there (Table 1). Mediterranean Gulls preferred islands with dry ground and herbaceous vegetation not higher than 20–30 cm at the beginning of the season (at the end of the season it was up to 1.5 m). Single bushes or even trees were growing on the islands, usually at the part of the island not occupied by the colony. On many of the river islands and occasionally also in the gravel pits, vegetation cover did not grow to form a dense surface. In such cases, birds built their nests on sandy ground. Piles of soil mined during excavation were prevalent on these islands. Only few breeding records took place in rushes growing in water or in reed-beds (Betleja et al. 1996).

The size of breeding groups

Mediterranean Gulls nest in Poland in single pairs or in groups of several pairs, exclusively within the colonies of other *Laridae* species (Table 2) and mainly in large colonies of the Black-headed Gull, which consist of several hundreds to a few thousand pairs. Only at two breeding sites, in single years, on the islands of the Vistula river, were Mediterranean Gulls found to nest in small mono-

Table 1 The types of water reservoirs occupied by the Mediterranean Gull *Larus melanocephalus* in Poland, 1981–2005

Type of water reservoirs	Number of breeding sites (%)	Number of nests/pairs (%)
Rivers	12 (26.7)	138 (43.3)
Fish ponds	11 (24.4)	25 (7.8)
Dam reservoirs	9 (20.0)	61 (19.1)
Flooded areas	5 (11.1)	16 (5.0)
Gravel pits	4 (8.9)	40 (12.5)
Lagoons	2 (4.4)	8 (2.5)
Settling basins	1 (2.2)	16 (5.0)
Mining area	1 (2.2)	15 (4.7)
Total	45 (100)	319 (100)

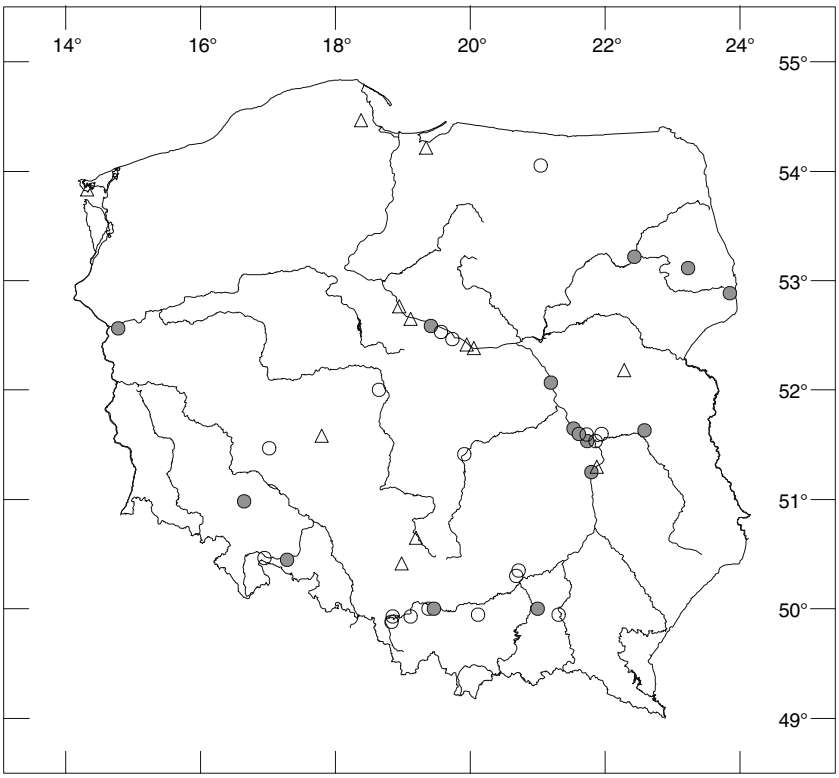

Fig. 2 Distribution of breeding sits of the Mediterranean Gull *L. melanocephalus* in Poland, 1981–2005. *Open triangles* Sites occupied 1981–1999, *open circles* sites occupied 2000–2005, *filled circles* sites occupied in both periods

Table 2 Maximum number of pairs of Mediterranean Gull *L. melanocephalus* at any one particular breeding site in Poland between 1981–2005

Maximum number of nests/pairs	Number of breeding sites (%)
1	18 (40.0)
2–5	21 (46.7)
6–10	6 (13.3)
Total	45 (100)

specific colonies of the Common Gull (Nawrocki and Wesołowski 1984). In 87% of all identified sites, the number of simultaneously breeding Mediterranean Gull pairs did not exceed five (Table 2). Within the colonies, the Mediterranean Gull nests were distributed among nests of other species or clumped in groups of two or three.

Discussion

The population of Black Sea Mediterranean Gulls is known to show strong fluctuations in numbers in approximately 20-year cycles (Rudenko 1999). The expansion of the Mediterranean Gull into Western and Central Europe occurred at the beginning of the 1950s and 1960s when the resident population in the Black Sea area was reaching peak numbers, increasing from 50,000 to 150,000 pairs (Rudenko 1999). The first breeding records in Western and Central Europe (Bekhuis et al. 1997; Meininger and Flamant 1998; Sadoul and Raevel 1999; Chytil 1999; Boschert 2002) correspond with this sharp population increase. At the end of the 1980s, Mediterranean Gull populations in Belgium, the Netherlands, France and Germany were stable (Bekhuis and Meininger 1990), but in the 1990s the population numbers started to grow. By the end of the 1990s, 650 breeding pairs were recorded in The Netherlands and Belgium, 750 pairs in France, 185 in Hungary and nearly 120 pairs in Germany (Meininger and Flamant 1998; Sadoul and Raevel 1999; Varga et al. 1999; Boschert 2002).

Contrary to population trends observed in Western Europe, the establishment of breeding Mediterranean Gulls in Poland occurred relatively late (Nitecki 1984), and population growth in this country seemed to be very slow. Despite the undoubted increase in the population size recorded in Poland in the end of the 1990s, the higher numbers recorded after 2000 are believed to be the result of more efficient and alert observers. Many observers have been encouraged to visit large colonies of Black-headed Gulls, potentially attractive breeding sites for Mediterranean Gulls, and to examine carefully all birds breeding there. The regular ringing of gull chicks has resulted in more complete and accurate information on the identification of Mediterranean Gull eggs and chicks. Moreover, Mediterranean Gull ringing projects have been started in a few colonies in the Vistula river valley and in the southern part of the country.

To date, large colonies of the Mediterranean Gull – i.e. several tens of nests – such as those occurring in Slovakia or Germany (Chytil 1999; Boschert 2002) have not been found in Poland. However, breeding pairs of this species have been recorded throughout Poland, and each year new breeding sites are discovered. The reasons for this dispersed distribution in the western part of the country, which neighbours Mecklemburg-Vorpommern, Brandenburg and Saxony, all regions with several sites of large numbers of Mediterranean Gull breeding pairs (up to 20 pairs), is unclear (Boschert 2002). It is proving to be very difficult to determine the basic direction of the species' expansion in this part of the continent. Western European populations show a high productivity (Meininger and Flamant 1998) and supply regions with less numerous breeding populations. This is confirmed by the recoveries of birds ringed abroad and resighted at breeding sites in Poland or ringed in Poland at breeding colonies and later found nesting elsewhere (unpublished ringing data, T. Iciek, PK, PS, MZ, PZ).

The Mediterranean Gull has a very low philopatry. Individuals ringed as adults in Belgian and Dutch colonies have been found among the birds breeding in Poland. Adult birds ringed in Polish breeding colonies have been observed in Belgian, German or Czech colonies. Several recoveries also confirm that adult Mediterranean Gulls regularly change breeding sites within the country. One pair changed its breeding sites three times in three successive breeding seasons, moving 26, 208 and 232 km from year to year. Several other gulls have been captured at a distance of 23–232 km from previously known breeding sites.

Based on our current stage of knowledge, we cannot explain why the number of Mediterranean Gulls breeding pairs is increasing much more slowly in Poland than in Western European countries that are, in comparison, further away from the initial Black Sea population, where the species prefers small islands in coastal regions (Goutner 1986; Goutner 1987; Ardamatskaya 1993; Ardamatskaya 1999; Rudenko 1999). During the last 5 years, the size of the Polish breeding population has varied more than it did during the last years of twentieth century, but it has not increased markedly (Table 1). On the other hand, the habitat flexibility shown by this species, its strong population increase beyond the Polish western and southern borders and its low philopatry as well as the high population numbers of Black-headed Gulls are considered to be

beneficial to this species (Källander and Lebreton 1997; Meininger and Flamant 1998; Tomiałojć and Stawarczyk 2003), suggesting that we can also expect a more dynamic population increase in Poland.

Zusammenfassung

Die Ausbreitung der Schwarzkopfmöwe Larus melanocephalus in Polen

Seit dem ersten Brutnachweis der Schwarzkopfmöwe Larus melanocephalus in Polen im Jahre 1981 hat der Bestand deutlich zugenommen. Während er bis 1997 stabil war und nicht über 10 Paare hinausging, setzte danach eine ausgeprägte Zunahme ein. Während der Jahre 2001–2005 brüteten 26–29 Brutpaare in Polen. Bis heute wurden 45 Brutgebiete besiedelt, bis zu 19 pro Jahr. 27% der Brutgebiete (43% aller Bruten) wurden auf Inseln an der Mittleren Weichsel gefunden. Brutplätze an anthropogenen Binnengewässern lagen auf Dämmen (20% der Gebiete, 19% der Bruten), in Kiesgruben (9%, 13%) und an Fischteichen (24%, 8%). Schwarzkopfmöwen nisteten als einzelne Paare oder in kleinen Gruppen von weniger als 10 Paaren; 87% der Gruppen bestanden aus nicht mehr als 5 Paaren. Die Mehrheit der Brutversuche wurde in Lachmöwen- (Larus ridibundus) Kolonien festgestellt, die aus einigen 100 oder 1000 Paaren bestanden. In zwei Fällen wählten Schwarzkopfmöwen mono-spezifische Sturmmöwen- (L. canus)

Kolonien von 60–150 Paaren als Brutplatz. Die stärkste Klumpung der Brutgebiete lag an der Mittleren Weichsel und im südlichen Landesteil.

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References

Ardamatskaya TB (1993) The difference in breeding habitats of the Mediterranean Gull *(Larus melanocephalus)* in the Black Sea and the Baltic region. Ring 15:378–381

Ardamatskaya TB (1999) Breeding sites of Mediterranean Gull *Larus melanocephalus* in the countries of the former Soviet Union. In: Meininger PL, Hoogendoorn W, Flamant R, Raevel P (eds) Proc 1st Int Mediterranean Gull Meet. EcoNum, Bailleul, pp 19–24

Betleja J, Henel K, Schneider G (1996) The second breeding record of the Mediterranean Gull *Larus melanocephalus* in Silesia (in Polish with English summary). Birds Silesia 11:151–152

Bekhuis J, Meininger PL (1990) Mediterranean Gull *Larus melanocephalus*. Bird Census News 3:6–9

Bekhuis J, Meininger PL, Rudenko AG (1997) Mediterranean Gull *Larus melanocephalus*. In: Hagemeijer WJM, Blair MJ (eds) The EBCC atlas of European breeding birds. T and AD Poyser, London, pp 324–325

Boschert M (1999) Population trends and status of Mediterranean Gull *Larus melanocephalus* as a breeding bird in Germany. In: Meininger PL, Hoogendoorn W, Flamant R, Raevel P (eds) Proc 1st Int Mediterranean Gull Meet. EcoNum, Bailleul, pp 43–46

Boschert M (2002) Population trend and current situation of the Mediterranean Gull *Larus melanocephalus* in Germany. Vogelwelt 123:241–252

Chytil J (1999) The present status of Mediterranean Gull *Larus melanocephalus* in the Czech Republic, with notes on Slovakia. In: Meininger PL, Hoogendoorn W, Flamant R, Raevel P (eds) Proc 1st Int Mediterranean Gull Meet. EcoNum, Bailleul, pp 39–40

Cramp S, Simmons KEL (1983) The birds of the Western Palearctic. Waders to Gulls, vol. 3. OUP, Oxford

Dobbrick W (1931) *Larus melanocephalus* Temm In Westpreussen. Orn Monatsber 39:53

Fjeldsa J (1977) Guide to the young of European Precocial Birds. Scarv Nature, Tisvildelje, Denmark

Gibbons DV, Reid JB, Chapman RS (1993) The new atlas of breeding birds in Britain and Ireland: 1988–1991. T and AD Poyser, London

Goutner V (1986) The ecology of the first breeding of the Mediterranean gull (*Larus melanocephalus* Temminck 1820) in the Evros Delta (Greece). Ökol Vögel 8:189–197

Goutner V (1987) Vegetation preferences by colonies of Mediterranean Gulls (*Larus melanocephalus*) and Gull-billed Tern (*Gelochelidon nilotica*) in the Evros Delta. Seevögel 8:29–31

Källander H, Lebreton J-D (1997) Black-headed Gull *Larus ridibundus*. In: Hagemeijer WJM, Blair MJ (eds) The EBCC atlas of European breeding birds. T and AD Poyser, London, pp 328–329

Leibak E, Lilleleht V, Veromann H (1994) Birds of Estonia status, distribution and numbers. Estonian Academy Publishers, Tallin

Makatsch W (1974) Die Eier der Vogel Europas, vol 1. Neumann Verlag, Radebeul

Meininger P, Flamant R (1998) Breeding populations of Mediterranean Gull *Larus melanocephalus* in The Netherlands and Belgium. Sula 12:129–138

Nawrocki P, Wesołowski T (1984) Breeding of Mediterranean Gull in the middle course of the Vistula (in Polish with English summary). Not Orn 25:59–61

Nitecki Cz (1984) The first record of breeding of Mediterranean Gull in Poland (in Polish with English summary). Not Orn 25: 57–58

Rudenko AG (1999) Mediterranean Gull *Larus melanocephalus* in the Black Sea Reserve: population trends and breeding success. In: Meininger PL, Hoogendoorn W, Flamant R, Raevel P (eds) Proc 1st Int Mediterranean Gull meeting. EcoNum, Bailleul, pp 121–130

Ruprecht AL (1987) Mediterranean Gull (*Larus melanocephalus* Temminck, 1820) in the environs of Ciechocinek (Włocławek Province) (in Polish with English summary). Przegl Zool 31:355–358

Sadoul N, Raevel P (1999) Distribution, population trends and status of Mediterranean Gull *Larus melanocephalus* as a breeding bird in France. In: Meininger P L, Hoogendoorn W, Flamant R, Raevel P (eds) Proc 1st Int Mediterranean Gull Meet. 1998. EcoNum, Bailleul, pp 55–57

Szczepski JB, Szczepska MW (1956) Report of the Ornithological Station for 1950 (in Polish). Acta Orn 5:77–112

Tomiałojć L (1990) Birds of Poland distribution and numbers (in Polish). PWN, Warsaw

Tomiałojć L, Stawarczyk T (2003) The avifauna of Poland distribution, numbers and trends (in Polish with English summaries). PTPP proNatura, Wroclaw

Varga L, Veprik R, Szell A, Bakacsi G (1999) Colour-ringing of Mediterranean Gulls Larus melanocephalus in Hungary in 1994–1998. In: Meininger PL, Hoogendoorn W, Flamant R, Raevel P (eds) Proc 1st Int Mediterranean Gull Meet. EcoNum, Bailleul, pp 97–101

Winkler R (1999) Avifauna der Schweiz. Ornith Beob Beiheft 10:1–252