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Population trends, distribution, ring recoveries and conservation of Mediterranean Gull *Larus melanocephalus* in Greece

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ABSTRACT

The Greek Mediterranean Gull populations reached a maximum of 7,400 pairs in the 1980s (1988), then dropping considerably with less than 2,000 pairs in most years during the 1990s. In the 1980s the most important breeding area was Alyki Kitrous whereas in the 1990s it was the Axios Delta. In some years breeding also took place in some other wetlands such as Nestos and Evros Deltas and at Porto Lagos. Habitats used were saltmarshes and sandy coastal islands. Twenty-eight different Mediterranean Gulls ringed as chicks at Alyki were recovered, mostly in Italy (20) and also in Albania, France and Spain. Habitat loss and predation are the main threats to the Greek breeding population.

RÉSUMÉ

Tendances de population, distribution, reprises de bagues et conservation de la Mouettes mélanocéphale *Larus melanocephalus* en Grèce. Les populations grecques de la Mouette mélanocéphale ont atteint un maximum de 7.400 couples dans les années 80 (1988), pour ensuite chuter considérablement jusqu'à moins de 2.000 couples pendant la plupart des années 90. Alors que le site de nidification le plus important des années 80 se situait à Alyki Kitrous, celui des années 90 fut le delta de l'Axios. Durant quelques années, la nidification a également eu lieu dans d'autres zones humides tels les deltas du Nestos et de l'Evros et à Porto Lagos. Les habitats utilisés étaient des salines et des îles côtières sablonneuses. Au total, 28 individus différents de Mouette mélanocéphale, bagués comme poussins à Alyki, ont été repris, la plupart en Italie (20), mais également en Albanie, en France et en Espagne. La perte d'habitat et la prédation constituent les principales menaces pour la population nicheuse en Grèce.

INTRODUCTION

The Mediterranean Gull *Larus melanocephalus* is a medium sized gull which up to the end of the 1980s used to breed within the Black Sea and Mediterranean regions (Cramp & Simmons 1983, Goutner & Isenmann 1993). In the 1980s these birds expanded their breeding range from the Mediterranean towards north-west Europe (Meininger & Bekhuis 1990, Meininger & Flamant 1998) resulting in an international interest for the study of their movements and population dynamics.

In the Mediterranean/Black Sea areas, Mediterranean Gulls usually breed in estuarine/coastal areas using islands on sandy or sand-muddy substrate, in halophytic or ammophilus vegetation varying in cover and depending on the site (Goutner 1986, 1987, Fasola & Canova 1992, Chernichko 1993, Fasola *et al.* 1993). In the European Community, there is a special conservation concern about the Mediterranean Gull, resulting in this species being included in the EC Directive 79/409. Conservation of wetlands and their birds in Greece is particularly important regarding the fact that the wetland habitats and their bird populations are continuously diminishing. The Mediterranean Gull is a species very sensitive during the breeding season: even slight habitat alterations, predation pressure or disturbance discourages breeding and forces the birds to look for alternative sites. As a matter of fact, suitable undisturbed breeding areas in wetlands are scarce, thus conservation of the Mediterranean Gull goes hand in hand with the conservation of many Greek wetlands.

This paper presents the population trends and distribution of the Mediterranean Gull in Greece in the 1980s and 1990s, and also results of ringing carried out in the 1980s and comments on the conservation of the species in Greece.

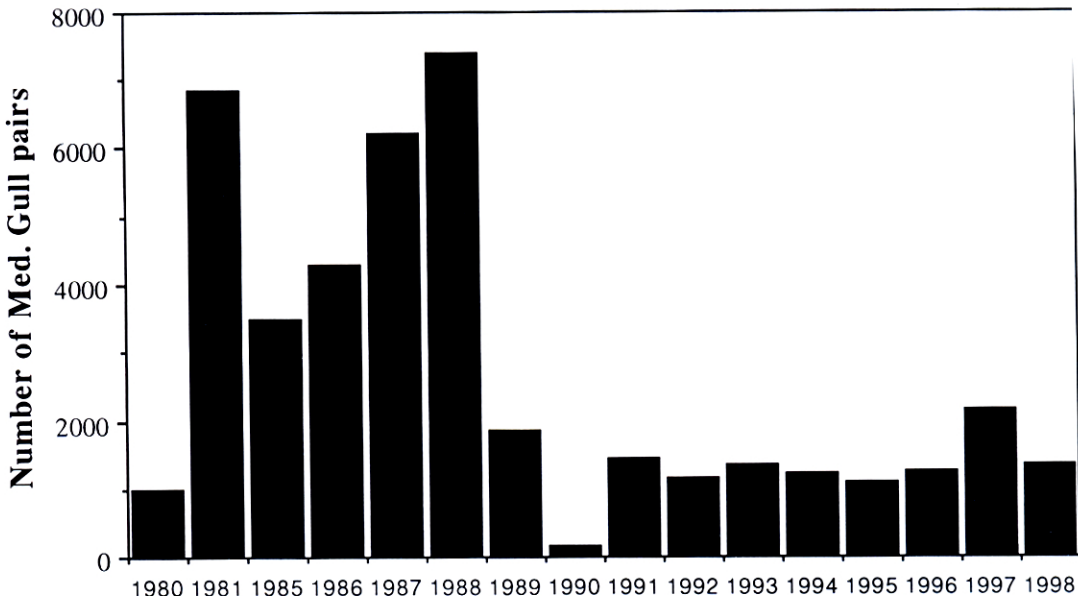


Figure 1. Number of breeding pairs of Mediterranean Gull *Larus melanocephalus* in Greece in 1980-1998.
 Figure 1. Nombre de couples nicheurs de Mouette mélanocéphale *Larus melanocephalus* en Grèce de 1980 à 1998.

METHODS

In the 1980s and 1990s we systematically monitored the breeding population of the Mediterranean Gull by surveying the Greek wetlands during the breeding season. The breeding populations were mostly estimated through counts of birds present at the colony sites. From 1985 to 1988, a total of 1,728 chicks were ringed with metal rings, mainly at Alyki Kitrous (hereafter Alyki) and in the Evros Delta. Ringing recoveries were provided by the Hellenic Bird Ringing Centre.

RESULTS AND DISCUSSION

Breeding population

In the 1980s, the Greek population of Mediterranean Gull reached a maximum of c. 7,400 pairs in 1988. The most important breeding area was Alyki, followed by the Evros Delta. Occasional breeding occurred in some other wetland areas (such as Karatza lagoon, north-eastern Greece). After 1988, the populations dropped dramatically, so that in the 1990s the Greek population did not exceed 1,500 pairs, with the exception of 1997 (2,150 pairs) (Figure 1). The population drop from 1980 to 1998 was statistically significant ($F = 4.9$, $R^2 = 0.3$, $P = 0.044$). In the 1990s, the most important breeding area was the Axios Delta whereas in some years breeding took place in the Nestos Delta, Porto Lagos and in the Evros Delta (Figure 2).

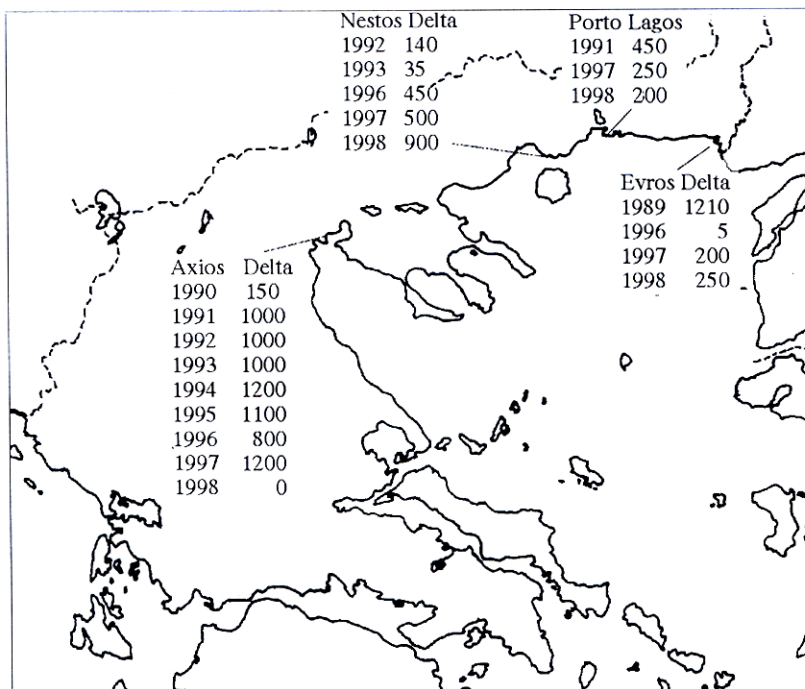


Figure 2. Number of breeding pairs of Mediterranean Gull *Larus melanocephalus* at the most important breeding sites in Greece in 1989-1998.

Figure 2. Nombre de couples nicheurs de Mouette mélanocéphale *Larus melanocephalus* sur les principaux sites de nidification en Grèce de 1989 à 1998.

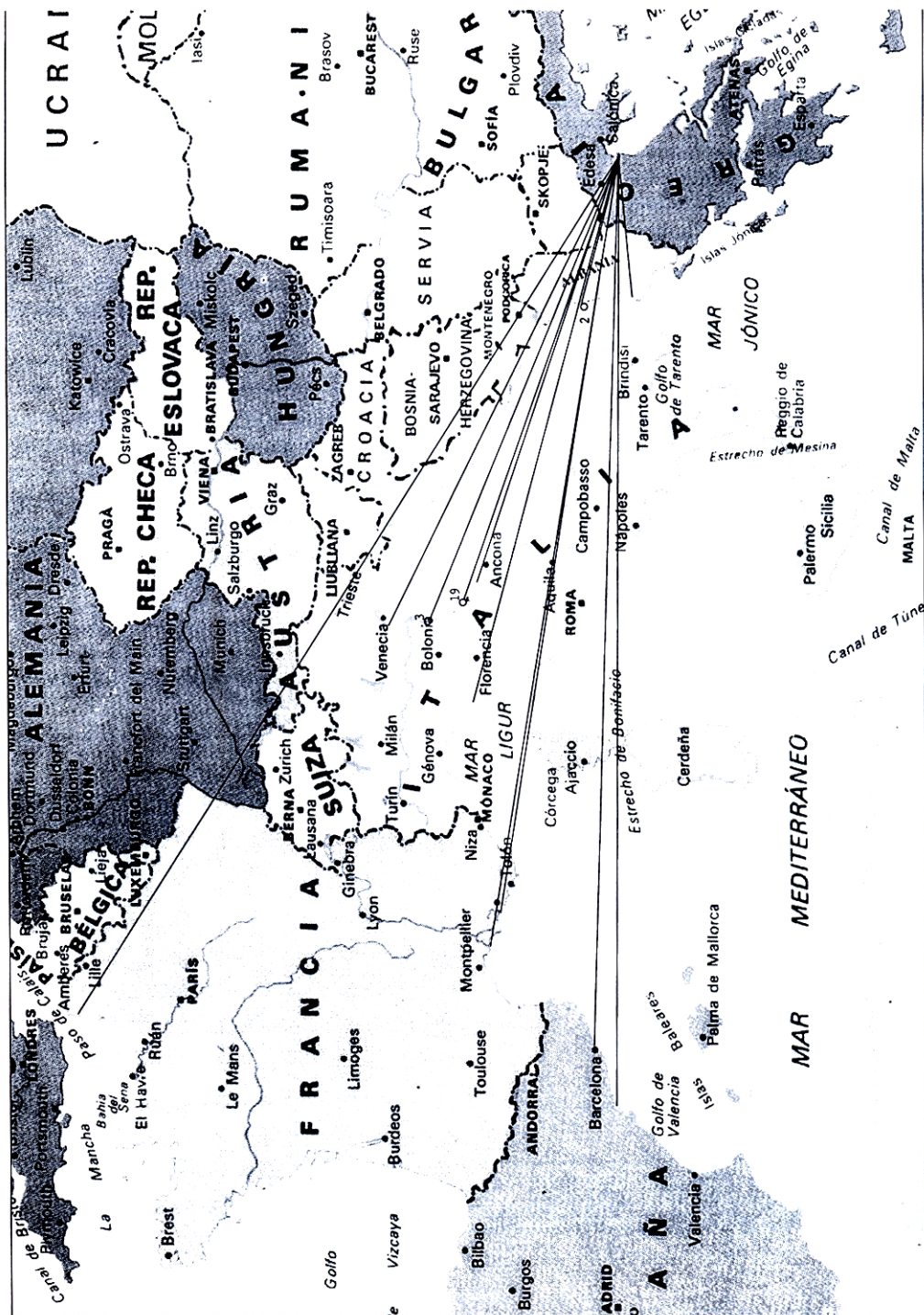


Figure 3. Recovery sites of Mediterranean Gulls *Larus melanocephalus* ringed at Alyki, NE-Greece.
 Figure 3. Sites de reprise des Mouettes mélanocéphales *Larus melanocephalus* baguées à Alyki dans le Nord-Est de la Grèce.

In each area the gulls usually formed a single colony, sometimes divided into sub-colonies, depending on the habitat formation, but in the Axios Delta in 1997 two well-separated colonies were present on coastal islands. In 1991, a small colony of c. 50 pairs was formed at Kalochori lagoon near the estuary of the Gallikos river, situated in the eastern part of the wetland complex of the rivers Axios-Gallikos-Loudias and Aliakmon in Thermaikos Gulf.

The habitat used by the Mediterranean Gulls was in nearly all cases small islands with halophytic vegetation of *Arthrocnemum* and *Halimionetum*, surrounded by water. Only in the Evros Delta in some years the gulls bred on a coastal sandy island.

Ring recoveries

A bird ringed as a chick in 1985 at Alyki was found dead on the nest at the same place in 1988. There have been a number of ringed birds that have been reported from in Greece, but they have not been included in this study. Twenty-eight different Mediterranean Gulls ringed as chicks at Alyki in the 1980s were recovered from Albania, Italy, France and Spain. Five of these were found dead, the others were alive (Table 1, Figure 3). Most records originated from the Adriatic coast of Italy (between Ancona and Venice). The most important site was Conca Invaso, an artificial reservoir in the region of Cattolica (near Rimini) where in total 19 ring-readings were made and some birds were re-read in successive days, months or years. Most aged 8-11 years. The longest distance covered by a ringed Mediterranean Gull was 1,985 km, sighted at Boulogne-sur-Mer, Pas-de-Calais, northern France.

The recoveries indicate a tendency of the Mediterranean Gull to move from their Greek breeding areas to the western Mediterranean. More recent data indicate that some immature colour-marked individuals occurred in the Axios Delta (their hatching area) in their first summer and second winter. To what extent these birds remained in the area after breeding or returned after having moved elsewhere is not known.

Conservation

At the end of the 1980s, Alyki was the most important breeding area of the Mediterranean Gull in the Mediterranean basin, hosting 7,300 pairs. This site rapidly became unsuitable due to the intensification of the salt production in the industrial salinas of this area. Starting in spring 1989, large quantities amounts of salt-water were pumped from the lagoon resulting in the shallowness of its southern part, so that isolation of the breeding islands was lost early in the breeding season. A colony of 654 pairs on saline dikes was totally predated by terrestrial predators (Goutner & Papakostas 1992). This seems to have discouraged further breeding of Mediterranean Gulls in this area. The birds breeding in the Axios Delta in the 1990s probably originated from Alyki, situated only 20 km to the south. In the Axios Delta the Mediterranean Gulls bred at coastal islands but due to low elevation of the breeding sites, a large proportion of the nests was destroyed by flooding, resulting in a low breeding success. In the Evros Delta, the Mediterranean Gull colony which occupied an island in the Drana lagoon was vacated in 1987 due to draining of the lagoon by local people (Goutner & Jerrentrup 1987). The birds returned and bred at two islands in 1989 after re-flooding of the area (Goutner 1997), but then again disappeared until 1996. In some years the gulls alternatively used coastal islands of the delta where, however, there has been an increasing problem of predation (Goutner 1990) and habitat change due to vegetation succession (Goutner 1986), disturbance by people, and erosion of the coastal region of the delta. In 1998, predation by dogs and probably foxes led to the desertion of the breeding coastal island. Similarly to the Evros Delta, the Nestos Delta colonies usually suffered from predation

Table 1. Recoveries of Mediterranean Gulls *Larus melanocephalus* ringed at Alyki, NE-Greece.
Tableau 1. Reprises des Mouettes mélanocéphales *Larus melanocephalus* baguées à Alyki dans le Nord-Est de la Grèce.

Recovery site	Coordinates	Ring No	Ring Year (June)	Date found or read	Condition	Distance (km)
Albania						
Seman Delta, Fier	40 47' N 19 21' E	E000755	1987	March 1988	Dead	308
Vlore (Avlon)	40 29' N 19 29' E	5000197	1986	Aug. 1986	Alive (caught and released)	297
Sukth, Durres	41 23' N 19 33' E	5000196	1986	Aug. 1986	Unknown	300
Italy						
Senigallia, Ancona	43 43' N 13 13' E	E001257	1988	Nov. 1996	Alive (caught and released)	857
Conca Invaso, Cattolica	43 58' N 12 42' E	5000106	1985	July 1995	Alive (ring read in the field)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	5000227	1985	July 1995	Alive (ring read in the field)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000468	1985	July 1995	Alive (ring read in the field)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000649	1987	July 1995	Alive (ring read in the field)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000766	1987	Aug. 1996	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000379	1986	Aug. 1996	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	5000227	1986	Aug. 1997	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000468	1986	Aug. 1997	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000468	1986	16 Jul. 1996	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000468	1986	18 Jul. 1996	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000468	1986	20 Aug. 1996	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E000649	1987	Jul. 1997	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E001297	1988	Jul. 1995	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E001312	1988	Sept. 1996	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E001312	1988	Aug. 1996	Alive (caught and released)	906
Conca Invaso, Cattolica	43 58' N 12 42' E	E001312	1988	Jul. 1995	Alive (caught and released)	906
Cattolica (Spiaggia), Forli	43 58' N 12 44' E	E000958	1987	Sept. 1996	Alive (caught and released)	903
Cattolica (Spiaggia), Forli	43 58' N 12 44' E	E000266	1986	Oct. 1997	Alive (caught and released)	903
Cattolica (Spiaggia), Forli	43 58' N 12 44' E	5000227	1986	Sept. 1996	Alive (caught and released)	903
Marina di Massa, Massa	44 00' N 10 06' E	E000323	1986	Oct. 1986	Dead	1121
Porto Garibaldi (Comacchio)	44 41' N 12 14' E	E001355	1988	March 1997	Alive (caught and released)	972
Porto Garibaldi (Comacchio)	44 41' N 12 14' E	E000760	1987	March 1998	Alive (caught and released)	972
Valle Bertuzzi	44 48' N 12 13' E	E000879	1987	July 1997	Dead	979
Bossolaro, Venice	45 31' N 12 30' E	E000380	1987	Feb. 1997	Alive (caught and released)	999
France						
Port de Bouc, Marseille	43 24' N 05 00' E	E001088	1987	Sept. 1988	Alive (caught and released)	1513
Salin d' Aigues Mortes	43 34' N 04 11' E	E000894	1987	May 1989	Alive (ring read in the field)	1580
Boulogne-sur-Mer	50 43' N 01 37' E	E000814	1987	Oct. 1988	Alive (shot, kept in captivity)	1990
Spain						
Tarragona	41 07' N 01 15' E	E000900	1987	Oct. 1989	Dead	1823
Barcelona	41 25' N 02 10' E	5000193	1986	Oct. 1989	Dead	1744

by Red Foxes *Vulpes vulpes* and dogs. In late spring of 1996, many adult Mediterranean Gulls were found dead in rice fields having been poisoned by a parathion compound used by local people against rice pests.

In conclusion, Mediterranean Gull breeding populations, although declined in comparison to the 1980s, still use some north-eastern Greek wetlands in relatively good numbers, but their main threat remains loss of suitable wetland habitats and predation.

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