COASTAL PARKS AND RESERVES ALONG THE BLACK SEA AND THEIR IMPORTANCE FOR SEABIRDS

DIMITER NIKOLOV NANKINOV

Bulgarian Academy of Sciences, Institute of Zoology, Boul. 'Tzar Osvoboditel' 1, 1000 Sofia, Bulgaria

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SUMMARY

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The coastal line of the Black Sea is 4090 km long. Twenty-two parks and reserves, the total area of which is 907 357 ha, are located on the coast. The largest in area is the Danube Delta and Razelm–Sinoie complex in Romania with an area of 442 000 ha, which is 49% of the total area of the coastal parks and reserves along the Black Sea. The reserves of the Ukraine (six in number) with total area of 227 712 ha (25%), Turkey (three) with total area of 110 100 ha (12%), Russia (one reserve) – 118 340 ha (13%), Bulgaria (six) – 4944 ha (1%) and Georgia (two) – 4261 ha (<1%), follow. A total of 41 species of seabirds, 24 of which breed, have been recorded in the coastal parks and reserves along the Black Sea. The most numerous breeding species are the Mediterranean Gull *Larus melanocephalus* (over 90% of the world population), Common Tern *Sterna hirundo*, Sandwich Tern *S. sandvicensis*, Slender-billed Gull *L. genei* and Yellow-legged Gull *L. cachinnans*. The greatest numbers of seabirds breed in the Chernomorski Biosphere Reserve , the Danube Delta and Azovo-Sivash Reserve. With the exception of the Danube Delta, the other two reserves are included in the Ramsar Convention. On the coasts of the Black Sea and the Sea of Azov there are also other areas, which are neither coastal parks nor reserves, that play an important role for the breeding, migration and wintering of seabirds.

INTRODUCTION

The Black Sea is a typical inland sea, a part of the big intercontinental Mediterranean Sea. It is locked between the Balkan Peninsula, the Russian Plain, the Caucasus Mountains and Asia Minor, and borders on five countries: Bulgaria, Romania, the Ukraine, Russia, Georgia and Turkey. To the north the Kerch Strait connects it with the Sea of Azov, which can be treated as a large shallow bay of the Black Sea. The coastline of the Black Sea is 4090 km long; its area is 413 500 km^2. Together with the Sea of Azov it totals 462 000 km^2. The west–east length of the Black Sea is 1149 km and the distance between the Crimean Peninsula and Turkey at 263 km is the narrowest north–south distance. The water catchment area of the Black Sea is about 2.5 million km^2. Rivers of two continents flow into it. The Danube is the biggest river, with a water catchment area of 820 000 km^2. The Dnister, Don, Dnieper and Bug are smaller rivers; the Asian rivers are the Kuban and Rion; the Asia Minor rivers are the Kizilirmak and Yesilirmak (Valkanov *et al*. 1978).

Owing to its geographic location and varied landscape the Black Sea region is ornithologically speaking very important. The river deltas, the numerous coastal swamps and lakes, the sea bays and the scattered islands in addition to the salubrious climate and the abundance of food create conditions for nesting, migration and wintering for thousands of seabirds. During seasonal migrations the whole Black Sea region becomes a spectacular representation of the intensive East European migratory route which carries millions of birds from their European nesting sites to their wintering areas and back again.

Seabirds in the Black Sea region are protected in 22 parks and reserves (Fig.1), the total area of which is 907 357 ha: six in Bulgaria, one in Romania, one in Russia, nine in the Ukraine, two in Georgia and three in Turkey.

METHODS

The report contains information on the seabird populations of the Black Sea coastal parks and reserves. It draws on the author's findings during fieldwork in Bulgaria and also from published information about the Black Sea parks and reserves and their birds (Cramp & Ferguson-Lees 1963, Radu 1979, Roberts 1980,1981, Kostin 1983, Stoilov 1984, Borisov *et al*. 1985, Dijksen & Koning 1986, Dijksen & van der Wolf 1987, Dijksen & Blomert 1989, Sokolov & Syroechkovsky 1987, 1990, Ilichev & Zubakin 1988, Siokin *et al*. 1988, Grimmett & Jones 1989, Grimmett *et al*. 1989, Martins 1989, Paspaleva 1990, Korzyukov *et al*. 1991 and Chernichko 1993).

Unfortunately, not all Black Sea coastal parks and reserves have been sufficiently explored and knowledge of their avifauna remains incomplete. Some data were obtained additionally by correspondence or during meetings and talks with colleagues of the Black Sea region countries. It should be noted that the imperfect nature protection laws in certain countries have led to contradictory statements being published concerning some parks and reserves, due to changes in their status (e.g. by being placed under the jurisdiction of different umbrella organizations).

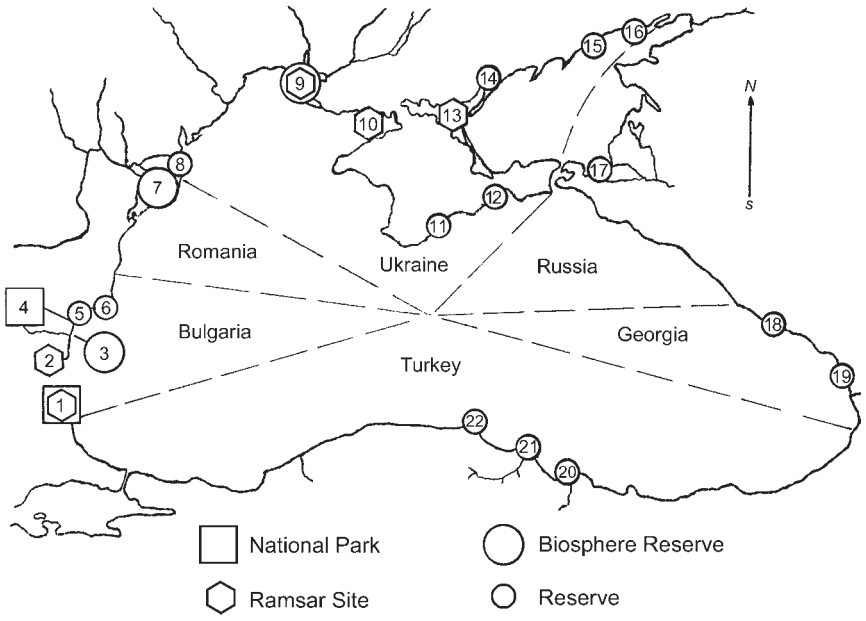

Fig. 1. *Coastal parks and reserves of the Black Sea. See text for names of numbered reserves.*

To define the importance of coastal parks and reserves I tried, in addition to species, to establish the maximum numbers of seabirds which breed or gather there during seasonal migrations and in winter. The maximum concentrations that have been established enable us to judge what nature protection potential exists for each listed reserve.

RESULTS

1. Ropotamo National Park (847 ha) is situated at the mouth of the Ropotamo River. It consists of four reserves: Arkoutino, Vodni Lilii, Zmiiski Ostrov and Morski Pelin. The first three support seabirds. The banks of the Arkoutino swamp (97 ha) are overgrown with thick aquatic vegetation and dense forests. The rocky island Zmiiski Ostrov (1 ha) which is 200 m from the shore is the main nesting site of seabirds. In some years the Yellow-legged Gull *Larus cachinnans* colony is as big as 40 pairs. Some 10 pairs of the Little Grebe *Tachybaptus ruficollis*, five pairs of the Black-necked Grebe *Podiceps nigricollis*, and Black-headed Gull *L. ridibundus*, Common Tern *Sterna hirundo*, Black Tern *Chlidonias niger* and others also build nests in the park. Zmiiski Ostrov is one of the sites in Bulgaria where the Manx Shearwater *Puffinus puffinus* is supposed to breed occasionally. The following numbers of seabirds have been recorded in the park during seasonal flights: Mediterranean Gull *L. melanocephalus* up to 300, Sandwich Tern *S. sandvicensis* 250, Great Cormorant *Phalacrocorax carbo* 200, Great Crested Grebe *Podiceps cristatus*, Manx Shearwater, Pygmy Cormorant *Phalacrocorax pygmeus*, Great White Pelican *Pelecanus onocrotalus*, Little Gull *L. minutus*, Black-headed Gull, Slender-billed Gull *L. genei*, Common Gull *L. canus* and Yellow-legged Gull. The largest winter populations are of the Black-necked Grebe (up to 150) and the Great Crested Grebe and Yellow-legged Gull (100 each).

2. Lake Atanassovsko Nature Reserve (1050 ha) is a part of a hypersaline lake from which salt is extracted in industrial quantities. The lake itself consists of numerous shallow pools (the water is 25 cm deep on average) divided by dikes on which thousands of birds nest. The lake is surrounded by deep canals (overgrown with reed), wetlands and cultivated fields. In the breeding period some 21 600 birds of 118 species, of them 4700 nesting birds, can be counted daily on Lake Atanassovsko. In some years it is the breeding site of the following birds: Common Tern (up to 285 pairs), Sandwich Tern (280), Mediterranenan Gull (200), Little Tern *S. albifrons* (112), Gull-billed Tern *Gelochelidon nilotica* (65) and Pygmy Cormorant (20). Lake Atanassovsko is virtually teeming with birds during migration. The following concentrations have been recorded: Black-headed Gull (30 235), Great White Pelican (14 800), Dalmatian Pelican *Pelecanus crispus*) (700), Little Gull (11 000), Mediterranean Gull (6132) Yellow-legged Gull (5000), Gull-billed Tern (1390), Slender-billed Gull (1386), Pygmy Cormorant (1000), Sandwich Tern (1000). Thousands of Mediterranean Gulls, Yellow-legged Gulls, Slender-billed Gulls and Black-headed Gulls moult on the lake. The winter concentrations are as follows: Black-headed Gull (up to 2060), Yellow-legged Gull (500), Mediterranean Gull (100), Slender-billed Gull (100), Great Cormorant (up to 47), Pygmy Cormorant (10), Great White Pelican (10) and Dalmatian Pelican (5). From time to time the Common Tern is also a winter visitor.

3. Kamtchia Biosphere Reserve (842 ha) is a dense forest in the delta of the Kamtchia River. From time to time the reserve is a nesting site of the Pygmy Cormorant, Little Grebe, Great Crested Grebe and Little Tern. The bay and the vast beach, where thousands of Mediterranean Gulls and Yellow-legged Gulls, and hundreds of Manx Shearwaters, Great Cormorants, grebes and terns concentrate, are of particular importance for the seabirds during migration and wintering.

4. Zlatni Piasatzi National Park (1320 ha) on the seashore north of the city of Varna is a deciduous forest, seven kilometres long, which borders the beach and the bay. Because of the large-scale tourist invasion it is the only shallow bay water space that is important for seabirds, mostly during migration and wintering. Hundreds of Manx Shearwaters, gulls, terns and grebes find rest and food there in autumn, winter and spring.

5. Baltata Nature Reserve (198 ha) is a well-preserved dense forest at the mouth of the Batova River. The nearby resort of Albena is the cause of the tourist invasion. The Little and Great Crested Grebes breed in the swampy places of the reserve; the Yellow-legged Gull sometimes breeds on the shore. Outside the breeding season the sea bay becomes the habitat of 1000 Mediterranean Gulls and hundreds of other species of gulls, cormorants, grebes, Manx Shearwaters and Black-throated Divers *Gavia arctica* (up to 10).

6. Cape Kaliakra Nature Reserve (688 ha) is listed for the exclusive purpose of protecting the hundreds of endemic

plants and the last habitat of the Mediterranean Monk Seal *Monachus monachus* in Bulgaria. For this reason the reserve comprises a vast sea area in addition to Cape Kaliakra. The caves and the steep shore are the only nesting sites of the European Shag *Phalacrocorax aristotelis* in Bulgaria (about 30 pairs). Approximately the same number of Yellow-legged Gulls nest on the cliffs. Thousands of seabirds have been observed in the bays and steppes during migration and wintering: Manx Shearwater (up to 13 500), Great Crested Grebe (8000), Mediterranean Gull (5000), Yellow-legged Gull (1000), Black Tern (1000), Common Gull (950), hundreds of other species of gulls, terns, grebes and cormorants. Up to 300 European Shags have been recorded.

7. Danube Delta and Razelm-Sinoie Complex Biosphere Reserve (442 000 ha). The Danube Delta together with the adjoining lakes, swamps, dense forests, reed fields, and sand beaches and dunes is a unique habitat of diverse wildlife. The sight of reed fields and floating reed islands so close to one another is not to be seen elsewhere in the world. In the Romanian part of the delta alone the reed (which is 5–6 m high) occupies 270 000 ha. Every year the Danube carries 58.7 million tonnes of alluvium to the delta and the sea. The river and the sea are in permanent conflict: new islands appear and disappear as do strips of sand; large areas are flooded or become dry. The wildlife and the vegetation in the Danube Delta are so varied that quantities and diversity have not been specified yet. The same holds true of the avifauna which is represented by 274 species. The three reserves created in the coastal region of the delta (Perisor–Zatoane 14 200 ha, Peritoaska–Lyahova 3900 ha and Roska–Buhaiova–Hreciska 15 400 ha) are specially intended to preserve the nesting sites of the Dalmatian Pelican, Great White Pelican, Pygmy Cormorant, Great Cormorant and other seabirds. Birds visit the Letea and Karaorman Reserves to nest, eat and rest. There used to be several pelican colonies in the delta, numbering tens of thousands. Today only two colonies remain. The Great White Pelican (2500 pairs) nests in the northern part of the delta around Maritsa–Mirhei and Babina; the Dalmatian Pelican colony (150 pairs) is in the southern part of the delta, around the St George arm. The Pygmy Cormorant population fluctuates between 1000 and 2500 pairs. Great Cormorants number about 3000 pairs, Sandwich Terns 2500; there are over 20 000 nests of the Common Tern, Whiskered Tern *Chlidonias hybrida* and Black Tern; there are hundreds of nests of the Yellow-legged Gull; the grebe, gull and tern breeding populations number hundreds of pairs. Tens of thousands of Manx Shearwaters, Mediterranean Gulls, Black-headed Gulls, Common Terns and Whiskered Terns, thousands of grebes, cormorants, pelicans and other seabirds can be observed in the Danube delta during migration.

8. Dunaiskie Plavni State Reserve (14 851 ha) is the northern part of the great Danube Delta (the Kilijskaya Delta) in the Ukraine. Some 70% of the waters of the Danube flow along the Kilijskaya arm; the river carries vast quantities of earth which settle in the sea and forms many islands and sand banks which are nesting sites for seabirds. A whole chain of new islands, the so-called Kuban and Kurile Islands, has been formed over the past two decades alone. Large areas of the reserve are occupied by swamps; the area of the coastal sand strips is about 400 ha. Of the 225 bird species found there 67 breed. Maximum numbers of seabirds are: Common Tern (12 000 pairs), Great Cormorant (2100), Great White Pelican (up to 2000), Sandwich Tern (up to 2000), Pygmy Cormorant (700), Yellow-legged Gull (500), Black-headed Gull (323), Mediterranean Gull (100), Whiskered Tern (100). As elsewhere in the Danube Delta, tens of thousands of Manx Shearwaters, gulls, terns, thousands of cormorants, pelicans and grebes make a stopover on their migratory routes or concentrate there.

9. Chernomorski Zapovednik Biosphere Reserve (113 200 ha) consists of the Black Sea Reserve, the Yagorlitski Ornithological Reserve and a kilometre-wide buffer zone around the reserve and along the western coast of the Tendrovsk Bay. The Chernomorski Zapovednik Biosphere Reserve is situated on the Kinbursk Peninsula, the littoral zones Potievski and Yagorlitski Kut, the islands in the Bay of Tendrovsk (Tendra, Babin, Smaleniy and Orlov) and in the Bay of Yagorlitsk (Dolgiy, Krugliy, Konskiy). Vast areas of the sea bays are also placed under protection. The reserve water area is five times larger than the reserve on land and thousands of nesting, moulting, migrant and wintering birds find rest and food there. The vegetation and wildlife diversity is exceptional. Of the 300 bird species 60 breed. The reserve is a real treasure with colonies of Mediterranean Gull (336 000 pairs, the largest number ever recorded in 1983), Slender-billed Gull (37 450), Sandwich Tern (30 800), Common Tern (11 325), Great Crested Grebe (5 120), Great Cormorant (5000), Yellow-legged Gull (4000), Gull-billed Tern (3528), Little Tern (464) and Caspian Tern *Sterna caspia* (150). Large numbers of seabirds visit the reserve during migration.

10. Karkinitski Zakaznik (Lebyazhie Ostrova) Temporary Reserve (27 646 ha) is situated on the northwestern shores of the Crimean Peninsula and the eastern shallow part of the Karkinitski Bay. The islands rise some two metres above the sea and are covered with sand banks, beaches and steppe vegetation. Reed covers half of the islands. The islands and the protected buffer zone (20 000 ha of the water space and the coastal regions) are the habitat of 255 bird species. This reserve is internationally important as a major nesting and wintering site for water birds in the northern Black Sea. From 11 000 to 15 000 birds of 21 species nest there every year. The 10 000 Yellow-legged Gull pairs make it the most numerous colony of this species. Other breeding seabirds are the Caspian Tern (up to 1064 pairs), Gull-billed Tern (900), Common Tern (500), Great Black-headed Gull *Larus ichthyaetus* (189), Slender-billed Gull (50) and Sandwich Tern (50). The number of Great Cormorants (670 pairs) that settled in the islands after 1976 is increasing. During migration the Karkinitski Bay teems with tens of thousands of seabirds of which gulls, terns and grebes are the most numerous. Wintering Black-headed, Common and Yellow-legged Gulls occur in thousands.

11. Mys Martyan State Reserve (240 ha) was established in 1973 on the southern coast of the Crimean Peninsula, in a zone of relict Mediterranean vegetation. Apart from Cape Martyan the reserve includes the Ai-Danil locality, a coastal strip and a 120 ha coastal water area. It is the nesting site of the Yellow-legged Gull and European Shag. Gulls, grebes, terns, Manx Shearwaters, Great Cormorants and European Shags are migrant visitors.

12. Karadag State Reserve (2855 ha) is situated east of Mys

Martyan, on the border between the Crimean mountain forests and the steppes of the Kerch Peninsula. In the south there is a kilometre-long reserve water area; to the south it borders on Koktebelsk Bay. The reserve includes 809 ha of sea surface. It is the habitat of about 100 bird species. The European Shag and Yellow-legged Gull breed on the sea shore. During migration many Great Cormorants, European Shags, gulls, Manx Shearwaters, grebes and divers occur.

13. Azovo-Sivash Zapovednik State Reserve (45 700 ha) consists of the Sivash Reserve and the hunting reserve estate on the isthmus Biryuchiy in the Sea of Azov. Sivash is a lake of lagoon origin; to the west the Perikop Strait separates it from Karkinitski Bay of the Black Sea; to the east the narrow (from 270 m to 7 km wide) and long (100 km) Arabatskaya Strela isthmus separates it from the Sea of Azov. A maze of shoals, bays, isthmuses, islands and peninsulas stretching over 112 km maintains the regime of the reserve. The vast quantities of invertebrates and the Brine Shrimp *Artemia salina* in the waters of the reserve provide staple food. It is the nesting site of the following seabirds: Yellow-legged Gull (11 000 pairs), Great Cormorant (10 800), Sandwich Tern (5462), Slender-billed Gull (5276), Mediterranean Gull (2000), Common Tern (1312), Gull-billed Tern (1060), Great Black-headed Gull (900) and Little Tern (900), Caspian Tern (442) and Pygmy Cormorant (200 pairs). Seabirds visit the reserve in large numbers during migration. The Little Gull alone numbers 30 000. The other gull and tern species also number thousands, and Great Cormorants, pelicans, grebes and other seabirds are recorded.

14. Molochny Liman State Reserve (22 450 ha) is a salty coastal lake connected with the Sea of Azov by a narrow canal. The lake receives the municipal waste water of the town of Melitopol. The lake abounds in small islands and shoals where seabirds build nests and find food. The reserve is the nesting site of the Sandwich Tern (5463 pairs), Common Tern (4234), Yellow-legged Gull (2500), Slender-billed Gull (1320,) Little Tern (947), Mediterranean Gull (790), Great Cormorant (600) and Gull-billed Tern (73 pairs). Gulls, terns and other seabirds make a stop there while on migration.

15. Belosarayskaya Kosa State Reserve (616 ha) is an isthmus on the northern Azov Sea coast. It is important for its colonies of the Common Tern (up to 1600 pairs), Little Tern (500) and Sandwich Tern (up to 100). Thousands of different species of gulls and terns remain on the isthmus and the surrounding water area in spring and autumn.

16. Krivaya Kosa State Reserve (154 ha) is an isthmus on the northern Azov Sea coast where the anthropogenic factor is strong. Some 4700 pairs of Common Terns, 1900 Sandwich Terns, 1500 Little Terns, 785 Yellow-legged Gulls, 350 Black-headed Gulls and 13 pairs of Great Black-headed Gulls breed in the reserve. During migration thousands of seabirds visit the reserve.

17. The Akhtarski and Sladki Liman Temporary Reserve (118 340 ha) comprises vast lowlands along the southeast Azov Sea coast. These are shallow salty lakes connected by a dense network of canals overgrown with vegetation. The lakes are eutrophic due to effluent from nearby animal farms. Seabirds in the reserve are represented by colonies of Dalmatian Pelicans (up to 45 pairs), Common Terns (1600) and Little Terns (500 pairs). The importance of the reserve increases during seasonal flights when thousands of gulls and terns and tens of grebes and divers visit.

18. Picundsko-Musserski Zapovednik State Reserve (3761 ha). It consists of three parts. The southern part of the Picunda Peninsula and almost the whole littoral territory of Cape Musserski support seabirds. Besides the reserve are 56 ha of beach and dunes and several small coastal lakes. The avifauna in the reserve is represented by 150 species. Few seabirds, mainly grebes, nest in the reserve in summer, because of strong anthropogenic influence. However, thousands of Great Crested Grebes, Slavonian Grebes *Podiceps auritus*, Black-throated Divers, Black-headed Gulls, Yellow-legged Gulls and hundreds of Manx Shearwaters, Great Cormorants and other seabirds can be observed during migration, especially in winter, in the bays, on the sand beach and in the lakes.

19. Kolhidski Zapovednik State Reserve (500 ha) is situated in the littoral part of the Kolhida Valley, at the mouth of the Rion River. It was established to preserve the swamps and the dense forests of the Kolhida Valley, and to protect its diverse wildlife. Lake Paleostomi, the major lake along the Caucasian Black Sea coast, is important for birds. The Little Grebe, Great Crested Grebe, Black-headed Gull and Whitewinged Black Tern *Chlidonias leucoptera* are some of the nesting seabirds in the reserve. The abundance of food in the Kolhida swamps, lakes and bays attract thousands of migrant seabirds to the eastern Black Sea coast: Black-throated Diver, Great Crested Grebe, Slavonian Grebe, Black-headed Gull, Yellow-legged Gull, other gull species, and Whitewinged Black Tern.

20. Yesilirmak Delta Hunting Reserve (60 000 ha) is a region of small lakes (Semenlik at 150 ha is the largest lake), lagoons, reed plots, and poplar and willow forests. A crucial habitat for the birds during migration and in winter, it is visited by thousands of Great Crested Grebes, Black-headed Gulls, Black-throated Divers and some other seabird species.

21. Kizilirmak Delta Hunting Reserve (50 000 ha) is the largest wetland along the Turkish Black Sea coast, a vast delta occupied by lakes, impenetrable swamps, reed plots, coastal forests and cultivated fields. The eastern part of the delta is better preserved with the lakes Liman (175 ha), Cernek (369 ha), Balik (828 ha) and Uzun (294 ha). The reserve is a nesting site for the following birds: Little Grebe (up to 20 pairs), Great Crested Grebe (about 50), Dalmatian Pelican (up to 70 pairs in 1970–1973), Common Tern (up to 50), and other seabirds. In winter it is the home of the Black-headed Gull (up to 13 800 birds), Great Crested Grebe (10 000), Yellow-legged Gull (2600), Little Gull (2500), Black-throated Diver (1500), Black-necked Grebe (600), hundreds of Little Grebes, other gull and tern species, Great Cormorant (up to 120), Pygmy Cormorant (40), Dalmatian Pelican (90) and Great White Pelican (2). Hundreds of seabirds visit the delta in spring and in autumn.

22. Sarikum Golu Nature Reserve (100 ha) is internationally important for waterfowl. A small river connects it to the sea; the environs are afforested. It is important as seabirds find food and rest there. Some 100 000 Great Crested Grebes, Little Grebes and Great Cormorants were recorded in October 1987.

Some other lands along the Black Sea coast are neither parks nor reserves, but they play a major role in the protection of seabirds. These are the lakes Vaya, Mandra, Pomorie and Dourankoulak (Bulgaria), the Delta of the Dniester, the Tiliguski and Kuyalanitski limans (Ukraine), the basins of the Kerch Peninsula and the eastern shore of the Sea of Azov (Russia), the rocky shore and island near Cam Burnu, Lake Yenicaga, the Terkos Lagoon (Turkey) and others.

DISCUSSION

Of the 41 seabird species recorded in the 22 coastal parks and reserves along the Black Sea 24 breed. The importance of the coastal parks and reserves for seabirds varies from season to season. The Chernomorski Zapovednik Biosphere Reserve in the Ukraine is most important for seabirds in the nesting period as it is the nesting site of the greatest number (over 434 000 pairs) of seabirds. In the Danube Delta the number is over 73 000 pairs; in the Azovo-Sivash Zapovednik, over 39 000; in Dunaiskie Plavni, over 20 000; in Molochny Liman, about 16 000 and in Karkinitski Zakaznik, about 14 000 pairs (Fig. 2).

The maximum numbers of breeding pairs show that the Mediterranean Gull is the most abundant species in the coastal parks and reserves along the Black Sea with 339 140 pairs (up to 336 000 pairs in the Chernomorski Zapovednik Biosphere Reserve alone, 2000 in Azovo-Sivash Zapovednik and 790 in Molochny Liman, 200 in Lake Atanassovsko). The Common Tern ranks second in terms of breeding populations: 57 626 pairs (over 20 000 pairs nest in the Danube Delta, 12 000 in Dunaiskie Plavni, 11 325 in the Chernomorski Zapovednik, 4700 in Krivaya Kosa, 4234 in Molochny Liman). The Sandwich Tern ranks third with 48 551 pairs (the greatest number is in the Chernomorski Zapovednik, 30 800 pairs), followed by the Slender-billed Gull (29 910 pairs), Great Cormorant (22 170 pairs), Black Tern (20 180) Whiskered Tern (20 150) Gull-billed Tern (6226) and Great Crested Grebe (5974 pairs). Other species recorded breed in smaller numbers.

The Chernomorski Zapovednik and the Danube Delta where maximum seabird concentrations have been recorded from 100 000 to 150 000, Dunaiskie Plavni (90 000) and Lake Atanassovsko (about 74 000) are of primary importance during the migration period (Fig. 3). The Mediterranean Gull with maximum concentrations over 150 000, Black-headed Gull (about 125 000), Little Gull (over 65 000), Common Tern and Yellow-legged Gull (about 40 000 each) are the most common migrants in the coastal parks and reserves along the Black Sea.

In winter the picture is different (Fig. 4). The habitats along the northern Black Sea coast and particularly the Sea of Azov become less important, for the climate is severe and the water bodies become covered with ice. The reserves along the Turkish

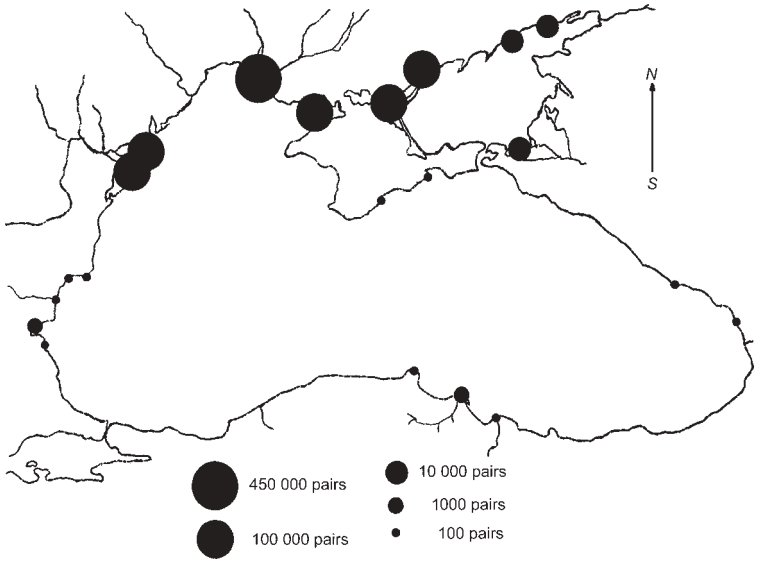

Fig. 2. *Breeding seabird concentrations in the coastal parks and reserves of the Black Sea.*

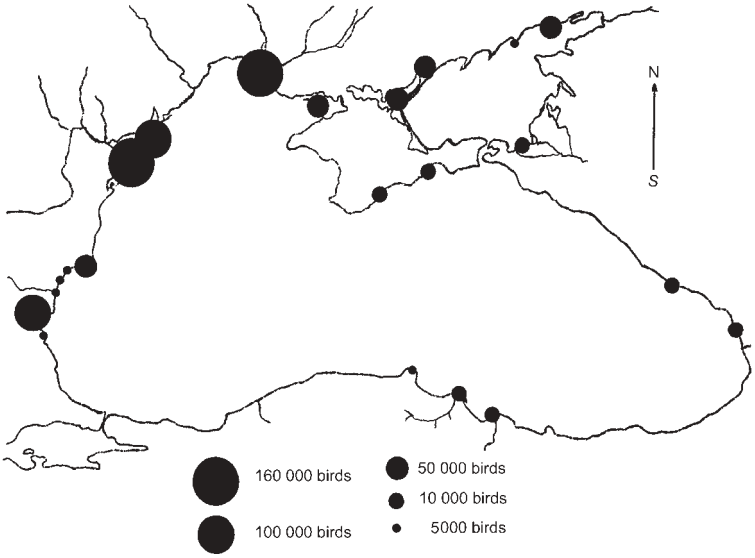

Fig. 3. *Concentrations of seabirds during migration in the coastal parks and reserves of the Black Sea.*

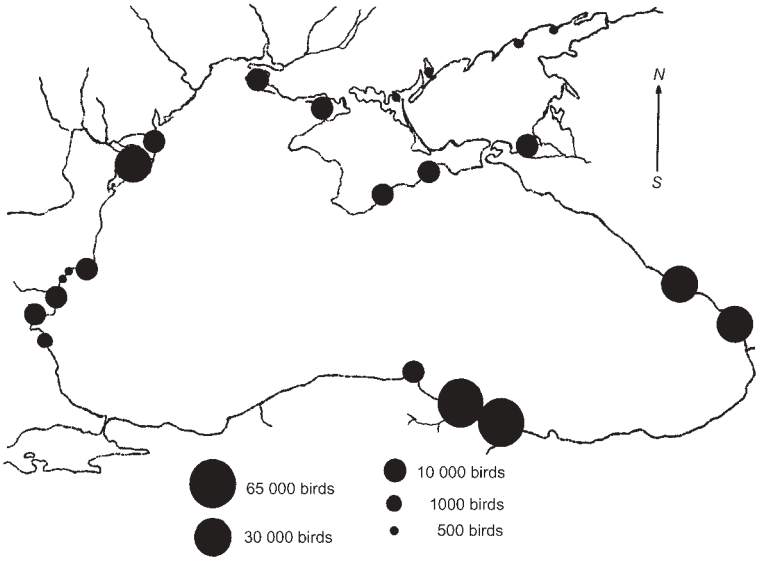

Fig. 4. *Concentrations of seabirds during winter in the coastal parks and reserves of the Black Sea.*

coast, especially the deltas of the Kizilirmak and the Yesilirmak, where maximum concentrations of various seabird species exceeding 30 000 have been recorded, then come to play an important role for wintering seabirds. The reserves on the water areas adjacent to the Caucasian coast, where over 10 000 seabirds stay, also become important. The maximum concentrations in the Danube Delta remain approximately the same. Most of the remaining coastal parks and reserves are wintering sites for 1000 to 10 000 seabirds. The Great Crested Grebe with maximum concentrations of about 80 000 ranks first among the seabirds wintering in the coastal parks and reserves. It is followed by Black-headed Gull (about 37 000), Yellow-legged Gull (about 15 000) and Black-necked Grebe (about 7500).

The coastal parks and reserves along the Black Sea are of exceptional worldwide importance in the protection of some seabird species. They are the nesting site of over 90% of the world population of the Mediterranean Gull, over 75% of the world population of the Pygmy Cormorant, over 65% of the world population of the Slender-billed Gull (estimated to be no more than 70 000 pairs (Ilichev & Zubakin 1988), and of most of the European Great White and Dalmatian Pelican populations. The water areas of the coastal parks and reserves are stopovers for several species considered threatened in Europe (Hudson 1975), such as the Great Northern Diver *Gavia immer*, Mediterranean Shearwater *Calonectris diomedea* and Grey Phalarope *Phalaropus fulicarius*.

Three of the existing coastal reserves along the Black Sea, Kamtchia, the Danube Delta and Chernomorski Zapovednik have been declared biosphere reserves by UNESCO (Fig. 1). The Ramsar Convention includes Lake Arkoutino (part of the Ropotamo National Park), Lake Atanassovsko, Chernomorski Zapovednik, Karkinitski Zakaznik and Azovo-Sivash Zapovednik as wetlands of international significance for waterfowl.

A number of negative factors affects the coastal parks and reserves along the Black Sea. The inland Black Sea is particularly sensitive to pollution. Oil is a serious potential pollutant of water, parks, reserves and a threat to birds, especially along the coast via which an oil tanker route goes. The Black Sea receives over 12 000 t of oil products on average annually. The rivers discharge industrial and residential waste and poisons (Valkanov *et al*. 1978). Fortunately, the deltas of some rivers are overgrown with reeds and other aquatic plants which are excellent biological filters. Virtually all coastal parks and reserves along the Black Sea are exposed to anthropogenic influences such as hunting, tourist invasion, reed burning, cattle grazing, reclamation and soil cultivation, and disturbance of breeding sites and concentrations of birds during migration and wintering.

Despite these problems the parks and reserves along the Black Sea coast are a valuable and indispensable chain of habitats that enable millions of birds to breed, find food and rest. The maintenance of a network of parks and reserves is one of the guarantees that seabirds and other bird species, originating from the vast expanses of Eurasia, will remain protected. However, for the next few years at least they will not be able fully to perform their nature protection functions due to the unstable political and economic situation in the region.

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