Wintering Waterbird Census in the Azov- Black Sea Coastal Wetlands of Ukraine, Georgia and Turkey

WETLANDS INTERNATIONAL

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Wetlands International Black Sea programme

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This publication presents the results of a gap analysis of the methodology and infrastructure of IWC on the Azov – Black Sea coasts of Georgia, Turkey and Ukraine, as well as presenting the results of wintering waterbird counts at key coastal wetlands of these three countries.

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Contents

Introduction

The coastal wetlands of the Black Sea region are important for millions of waterbirds wintering each year in that region. This attracts attention from ornithologists from the Black Sea countries as well as from international conservation organizations. The first counts were conducted about 80 years ago, but they were organised on a regular basis only due to the development of the International Waterbird Census (IWC). IWC has already quite a long history in the region – it was launched about 40 years ago, and a lot of data on wintering waterbirds was accumulated due to this. At the same time there is still a need for further improvement of IWC methodology and infrastructure in the Black Sea region, as well as using such improvements as a basis for development of monitoring system for migratory waterbirds. In relation to this in 2009 Wetlands International started the project *Stop-over Black Sea: the importance of the Black Sea region in the migratory systems of waterbirds in the African - Eurasian Flyway,* supported by BBI- MATRA fund. The project is directed at coastal wetlands of three Black Sea countries – Georgia, Turkey and Ukraine. The main partners of Wetlands International for this project are: Environmental Association "Psovi" in Georgia, Doga Dernegi in Turkey and the Azov-Black Sea Ornithological Station in Ukraine.

The aim of this report is to provide results of gap analysis of IWC in coastal wetlands of Georgia, Turkey and Ukraine, first of all in relation to current status of its methodology and infrastructure, as well as to present count data for key coastal wetlands.

Ukraine

Kostiushyn V., Andryuschenko Yu.

Ukraine' coastline is about 1,050 km long and includes many big bays, limans, lakes, deltas and other types of wetlands. 19 coastal wetlands are recognized as Ramsar sites. The majority of these wetlands play a very important role for waterbirds and support many hundreds of thousands of them during their wintering along the country's Azov-Black Sea coast. Winter waterbird counts have a long history in Ukraine. During that time Ukrainian scientists and birdwatchers have collected a large volume of information. This data has accumulated in IWC data base of Wetlands International and in IWC archives of Azov-Black Sea Ornithological Station of Ukraine. A large part of the historical counts data is already published. Within the current project new data from the last few years of IWC counts has also been collected, which is dispersed among counters. The current overview is based on all of these sources of information.

1.1. Brief history of wintering waterbirds count

The first publications devoted to the wintering waterbirds in the south of Ukraine appeared in the beginning of the 20th century concerning the Obitochna Spit (Костюченко, 1926, 1928а, 1928б, 1929а, 1929б, 1929с), the southern coast of the Crimea (Аверин, 1928; Даль, 1929), Yagorlytskii and Tendrovskii bays (Киселев, 1932). Only a few works appeared in the 1950s and 1960s (Берендейм, Перов, 1957; Федоренко, 1959, 1965). Regular winter counts of waterbirds were started in 1954 (Ардамацкая, 1975) by the Black Sea Nature Reserve and until 1984 were devoted to swans only. But in the 1970s in connection with the beginning of the systematic study of bird wintering sites the number of publications increased sharply and continues to grow up to the present day. A list of 200 publications devoted to the results of wintering waterbirds counts is presented at end of Ukrainian part of this report (see 1.7 References).

A systematic study of bird wintering sites was initiated by the Institute of Zoology of NASU. One of the key organizers of the research was B. Sabinevskiy. Under his guidance a vast body of data was collected. The development of monitoring efforts set the requirements for establishing a unified methodology. A major impetus for the transition from uncoordinated research of wintering birds to a comprehensive monitoring programme was the participation of Ukrainian ornithologists in the International Waterbird

Census, the coordinating role of the Azov–Black Sea Station and support from the Black Sea Programme of Wetlands International. Today the winter census of wetland birds is a constituent part of the Regional Ornithological Monitoring Programme (ROM) developed and implemented by the Azov–Black Sea Ornithological Station.

To stimulate participation of professional ornithologists and birdwatchers in IWC, from the mid 1990s different Ukrainian organizations – Nature Heritage Fund, Azov–Black Sea Ornithological Station and some others, together with Wetlands International Black Sea Programme, have regularly published results of waterbirds counts in brochure format. In the last few years this information has been published in several ROM bulletins.

1.2. Coordination of counts and network of organizations participating in IWC

Surveys in Ukraine are managed at two levels. The top level is the national coordinator responsible for organizing the work within the country and the second is represented by regional coordinators responsible for surveys undertaken in the regions and covering several wetlands or one large site. For the last 10 years the national coordinators have usually been representatives of Azov–Black Sea Ornithological Station.

From 1998 Wetlands International Black Sea office has supported IWC in Ukraine through different projects, by printing count results, improvement of methodology and, partly, field work.

The number of participants, both counters and organizations, varies from year to year, nevertheless there remains a stable core group of participants. This ensures the stable distribution of sites amongst the participants, at least at the regional level. In the western part of the Azov–Black Sea coastline – from the Danube to the Berezanskii Liman – counts are accomplished mainly by personnel of the Danube Delta Biosphere Reserve, Mechnikov University of Odessa, Mechnikov Research Antiplague Institute, Odessa Zoo and representatives of some other organizations, as well as birdwatchers. The Dniepro–Bugskii Liman, Yagorlytskii, Tendrovskii and Dzharylgachskii bays are mainly covered by personnel of the Black Sea Biosphere Reserve and the Regional Landscape Park "Kinburnskaya Kosa". Karkinitskiy Bay, Sivash, Kerch Peninsula Wetlands, Utlyukskii and Molochnyi Limans are mainly counted by the Azov–Black Sea Ornithological Station, Biosphere Reserve "Askania-Nova" and Melitopol State Pegagogical University. On the Crimean coast from Sevastopol to Feodosiya, as well as in inland waterbodies of this region, counts are accomplished by staff from Karadag Nature Reserve, Nikitskiy Botanical Garden, Crimea State Plague Control Station and the Sevastopol branch of the Institute of Biology of Southern Seas. The Azov coast (east of the Molochnyi Liman), including the Obitochnaya, Berdyanskaya, Belosarayskaya and Kryvaya spits, and bays of the same names, are monitored predominantly by the National Nature Park "Meotida". In total during last 15 years more than 50 people have taken part in IWC in Ukraine, with an average number of 20 – 30 participants per year. The majority of counters have already participated in IWC for about 10 – 15 years, and some of them even more than 20. The list of key participants and their contact details and names of the wetlands counted are presented in Annex 1. IWC participants annually hold meetings to discuss results of waterbird counts conducted and to plan further activities.

1.3. Methodological aspects of organizing and conducting censuses

Although the transition to a systematic study of wintering bird sites in the Azov–Black Sea region occurred far back in the 1950s, the real establishment of a monitoring programme began only in the early 1990s and is still in the phase of its completion. This is particularly true of such fundamental attributes of any monitoring programme as standardization of methods for collecting data, formation of a unified territorial scheme (i.e., site delimitation) for accomplishing counts, and establishment of a protocol for recording primary data. Consequently, despite the enormous volume of information collected during the winter counts in the Azov–Black Sea region of Ukraine, in many cases it is fairly difficult to analyze the data. The main reasons for this situation are the following:

– the lack of a final agreed list of wetlands where surveys are conducted and maps with exact boundaries of the sites;

– submitted information is often a combination of data from several sites, or sometimes even different years;
– in most cases there is no information on count coverage of each concrete wetland;
– the category "zero data" is absent. This category means results of a survey under which, for whatever reason, no birds were recorded at the site.

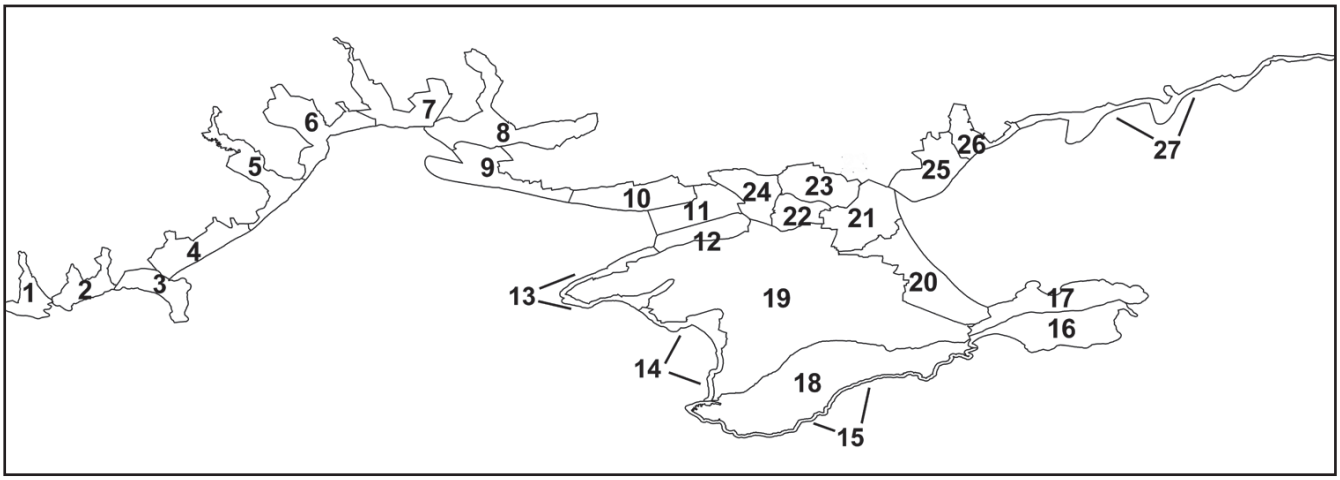
For quite a while serious attempts have been made by the Wetlands International Black Sea Programme and the Azov–Black Sea Ornithological Station to correct these deficiencies. First of all, the problem was discussed at the 25th Meeting of the Azov–Black Sea Ornithological Work Group (14–16 October 2005, Melitopol), where a decision was adopted to standardize the midwinter counts in the region for a more comprehensive integration into the International Waterfowl Census. The methodological recommendations for conducting the IWC were elaborated by Wetlands International (Delany, 2005), however the opinion of Ukrainian ornithologists, was to customize them to Ukrainian realities, namely:

– the large areas of Ukrainian wetlands;
– small number of potential counters (both professional and even more – amateurs);
– shortage of financial and technical facilities (vehicles, fuel, optics, computers, communication sets etc.).

On account of the large sizes of the wetlands and the corresponding length of survey routes, the main method for bird censuses is moving along the edge of a wetland by vehicle and stopping from time to time in places good for viewing the site. Since hard surface roads in many cases are absent, access to the site by vehicle can be hampered by deep snow or in mild winters by mud. It was recommended that surveys should not last more than five days, within which period, as a rule, the weather in the region stays relatively stable.The traditional dates for the census are 17th – 22nd of January, but they are allowed to shift between the 15th and 24th of January.

As mentioned above, the drawing–up of a final list of survey sites and delimiting their boundaries is one of the main problems on the path to standardizing wetland bird counts in Ukraine. In 2006 another attempt was undertaken to solve the problem – the Azov–Black Sea region was split into 27 survey units, relatively equal in size (see Pic.1).

Unfortunately, until today, delimitation of sites within consolidated sites has not been finalized. Since one of the main aims of distinguishing subunits is to achieve maximum convenience and efficiency in



1.Western Pridunavie; 2.Eastern Pridunavie; 3.Danube Wetlands; 4.Tuzlovskie Limans; 5.Dniester Wetlands; 6.Odessa Limans; 7.Tiligulski and Berezanski Limans; 8.Dniepro–Bugskie Wetlands; 9.Tendrovsko–Yagorlytskie Wetlands; 10.Dzharylgachskii Bay; 11.Northern part of Karkinitskii Bay; 12.Southern part of Karkinitskii Bay; 13.Tarkhankut Wetlands; 14.Western coast of Crimea; 15.Southern coast of Crimea; 16.Southern Wetlands of Kerch peninsula; 17.Northern Wetlands of Kerch peninsula; 18.Crimea Mountain Wetlands; 19.Crimea Plain Wetlands; 20.Southern part of Eastern Sivash; 21 Northern part of Eastern Sivash; 22.Southern part of Central Sivash; 23.Northern part of Central Sivash; 24.Western Sivash; 25.Utlyukskiye Wetlands; 26.Molochanskiye Wetlands; 27.Northern Priazovie.

Pic.1 List of consolidated sites for IWC

counts, it should be compulsory to have their sizes and boundaries agreed upon by regional coordinators and on–ground counters. The current stage of this process is presented in the list below, which include names of consolidated sites and sites (wetlands or their parts) for IWC conducting on the Azov–Black Sea coast of Ukraine:

1.0 Western Pridunavie
1.1 Kagul Lake
1.2 Kartal Lake
1.3 Kugurlui & Yalpug Lakes
2.0 Eastern Pridunavie
2.1 Katlabukh Lake
2.2 Safiany Lake
2.3 Kitai Lake
3.0 Danube Wetlands
3.1 Danube Delta
3.2 Stentsovsko–Zhebrianovskie Plavni
3.3 Zhebriianov Bay
4.0 Tuzlovskie Limans
4.1 Sasyk Liman with adjacent limans
4.2 Shagany & Alibei & Burnas Limans
5.0 Dniester Wetlands
5.1 Budakskii Liman
5.2. Gribovskii Liman
5.3 Dniester Liman
5.4 Dniester Delta
5.5 Kuchurganskii Liman
6.0 Odessa Limans
6.1 Sukhoi Liman
6.2 Khadzhibeiskii Liman
6.3 Odessa Bay
6.4 Kuyalnitskii Liman
6.5 Adzhalykskie Limans
7.0 Tiligulskii and Berezanskii Limans
7.1 Tiligulskii Liman
7.2 Berezanskii Liman
8.0 Dniepro–Bugskie Wetlands
8.1 Dnieper Delta
8.2 Dniepro–Bugskii Liman
8.3 Kinburnskaya Spit Wetlands
9.0 Tendrovsko–Yagorlytskie Wetlands
9.1 Yagorlytskii Bay
9.2 Tendrovskii Bay
10.0 Dzharylgachskii Bay
11.0 Northern part of Karkinitskii Bay
12.0 Southern part of Karkinitskii Bay
13.0 Tarkhankut Wetlands
13.1 Donuzlav Lake
13.2 Yarylgach Bay with adjacent lakes
13.3 Karzhinskii Bay with adjacent lakes
14.0 Western coast of Crimea
14.1 Sasyk Lake (Crimea)
14.2 Sakskoe Lake

14.3 Kalamitskii Bay
14.4 Kuzul-Yar Lake
15.0 Southern coast of Crimea
15.1 Sevastopol Bays
15.2 SC of Crimea (Balaklava - Simeiz)
15.3 SC of Crimea (Alupka - Yalta Bay)
15.4 SC of Crimea (Gurzuf - Alushta)
15.5 SC of Crimea (Alushta - Sudak Bay)
15.6 SC of Crimea (Meganom Cape - Kurortnoe)
16.0 Southern Wetlands of Kerch peninsula
16.1 Feodosiya Bay
16.2 Tobechikskoe Lake
16.3 Koyashskoe Lake
16.4 Uzunlarskoe Lake
17.0 Northern Wetlands of Kerch peninsula
17.1 Aktashskoe Lake
17.2 Astaninskie Plavni
17.3 Kerch Water Reservour
17.4 Chokrakskoe Lake
17.5 Achi Lake
17.6 Akmonaiskoe Lake
17.7 Kuchuk-Adzigol Lake
17.8 Adzigol Lake
18.0 Crimean Mountain Wetlands
18.1 Zagorskoe Water Reservour
18.2 Partizanskoe Water Reservour
18.3 Simferopolskoe Water Reservour
18.4 Belogorskoe Water Reservour
18.5 Barakol Lake
18.6 Koktebel Basins
19.0 Crimean Plain Wetlands
19.1 Mezhgornoe Water Reservour
20.0 Southern part of Eastern Sivash
21.0 Northern part of Eastern Sivash
22.0 Southern part of Central Sivash
23.0 Northern part of Central Sivash
24.0 Western Sivash
25.0 Utlyukskie Wetlands
25.1 Utlukskii Liman
25.2 Sivashik Liman
25.2 Frunzenskoe Lake
26.0 Molochanskiye Wetlands
26.1 Molochnyi Liman
26.2 Tubal`skii Liman
27.0 Northern Priazovie
27.1 Obitochnaya Spit & Bay
27.2 Berdianskaya Spit & Bay
27.3 Belosarayskaya Spit & Bay
27.4 Krivaya Spit & Bay

In this case large sites were split into smaller ones, whereas minor water bodies were pooled. This doesn't mean that within the survey units smaller ones cannot be distinguished, and primary data should

Pic. 2 Count map for IWC site Tendrovskii Bay

be collected within these survey subunits. For instance, such a large water body as the Sivash has been split into five survey units – Sivash Western, Southern and Northern parts of Central Sivash, Southern and Northern parts of Eastern Sivash, each having their distinct natural boundaries. In their turn all of them can easily be split into subunits since these areas include large bays, adjacent lakes etc. An example of pooling sites can be the site Western Pridunavie, which consists of several water bodies – Kagul Lake, Kartal Lake, Kugurlui & Yalpug Lakes. This approach makes it easier to organize the field work (in particular recruiting and maintaining the network of regional coordinators), leaving at the same time the option for a detailed account of bird numbers and accumulation of data. It should be stressed that the boundaries of the survey units and subunits do not always coincide with the borders of the water bodies. It has been taken into account that many bird species spend their day time on land near the water body and not on the water (geese, some ducks, gulls etc.), so the boundaries of many units cross dry land as well. For this reason counts embrace areas adjacent to the water body.

In order to make it easier to deliver data to the national coordinator an electronic (digital) form has been developed. This form has been elaborated according to the methodological recommendations set for the IWC (Delany, 2005). The completed form together with the map (Pic.2) of the survey unit is passed over to the regional coordinator. The map indicates:

- site borders;
- land and water areas covered by the census;
- places of the highest concentration of water birds (numbers and species composition of the concentration).

For a unified understanding by the counters of what is meant by the term "the size of a concentration" a special table has been elaborated for estimating for various bird species the minimum number of individuals which can be considered as a concentration (Table 1). This will allow mapping the concentrations within the survey area. Mixed concentrations will be recorded if the number of at least one of the constituent species exceeds the number quoted in the table for that particular species.

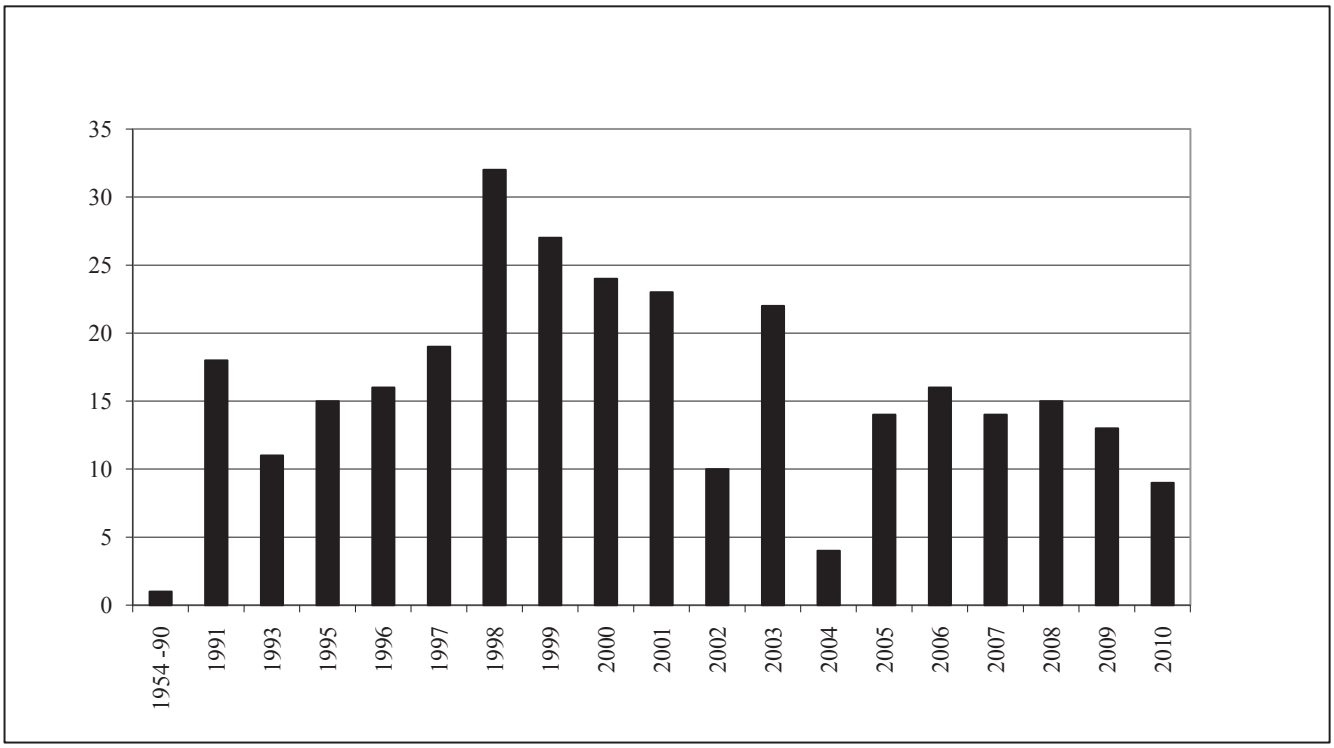
Table 1. The minimum number of wintering birds which can be considered as a concentration

N	Species	Number of birds	N	Species	Number of birds
1.	Podiceps nigricollis	300	21.	Anas spp.	300
2.	Podiceps grisegena	100	22.	Netta rufina	30
3.	Podiceps cristatus	100	23.	Aythya ferina	1000
4.	Podicipedidae spp.	300	24.	Aythya nyroca	50
5.	Phalacrocorax carbo	150	25.	Aythya fuligula	700
6.	Phalacrocorax pygmaeus	40	26.	Aythya marila	150
7.	Egretta alba	40	27.	Aythya spp.	1000
8.	Branta ruficollis	80	28.	Bucephala clangula	20
9.	Anser anser	80	29.	Mergellus albellus	30
10.	Anser albifrons	1500	30.	Mergus serrator	20
11.	Anser spp.	1500	31.	Mergus merganser	10
12.	Cygnus olor	400	32.	Anatinae spp.	700
13.	Cygnus cygnus	10	33.	Fulica atra	2000
14.	Cygnus spp.	400	34.	Vanellus vanellus	200
15.	Tadorna ferruginea	20	35.	Numenius arquata	35
16.	Tadorna tadorna	200	36.	Larus minutus	100
17.	Anas platyrhynchos	2000	37.	Larus ridibundus	1500
18.	Anas crecca	1000	38.	Larus cachinnans	350
19.	Anas penelope	300	39.	Larus canus	100
20.	Anas acuta	1000	40.	Larus spp.	1500

1.4. The time period and sites coverage

Regular winter counts of waterbirds were started in 1954 by the Black Sea Nature Reserve and until 1984 were devoted to swans only. From 1991 the geography of counts was seriously improved and already in that year were included 18 key wetlands along the Azov–Black sea coast of Ukraine from the Danube Delta up to the northern coast of the Azov Sea. In 1998 the number of sites counted reached a maximum - 32 (Pic.3). It is necessary to mention that even now some IWC information dispersed among counters has not been published or even submitted to the national coordinator. During the Stop Over Black Sea project IWC data for 2005 – 2010 was mainly collected from counters and published in ROM bulletin of the Azov-Black Sea Ornithological Station with support of Welands International.

Detailed information of site coverage is presented in Table 2. This also demonstrates one of the biggest methodological problems of IWC in Ukraine – irregular counting of many sites (even key sites) and submission of combined information for several sites, which also can vary from year to year. Such mixed, overlapping data makes analysis of IWC results more difficult.



Pic.3 Number of sites counted during the IWC 1954 – 2010

Table 2. Sites coverage during the IWC 1954 – 2010 in Ukraine

Site name	1954 –1990	1991	1993	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1. Western Pridunavie																			
Kagul.Kugurlui & Yalpug Lakes				1	1	1	1					1			1				
2. Eastern Pridunavie																			
Katlabukh, Safiany & Kitai Lakes				1	1	1	1												
3. Danube Wetlands																			
Danube Delta		1	1		1	1	1	1	1			1			1			1	
Zhebriianov Bay				1															
Stentsovsko–Zhebrianovskie Plavni					1	1	1	1	1	1									
4. Tuzlovskie Limans																			
Sasyk Lake with adjacent limans		1	1	1	1	1	1	1	1	1									
Shagany-Alibei & Burnas Limans		1	1	1	1		1	1	1	1									
Tuzlovskie Limans							1							1	1	1	1	1	1
5. Dniester Wetlands																			
Budakskii Liman						1	1	1	1	1									
Budakskii & Gribovskii Limans		1	1	1	1														
Dniester Delta & Kuchurganskii Liman					1	1	1	1	1	1									
Kuchurganskii Liman								1	1	1									
Dniestrovskii Liman						1	1	1	1	1									

Dniester Wetlands		1	1	1	1								1	1	1	1	1	1
6. Odessa Limans																		
Sukhoi Liman		1	1		1	1	1	1	1	1		1						
Khadzibeiskii Liman		1	1	1	1	1	1	1	1	1								
Odessa Bay				1	1	1	1	1	1	1		1						
Kuyalnitskii Liman		1	1	1	1	1	1	1	1	1		1						
Ajalykskii Limans					1	1	1	1	1	1		1						
Odessa Limans													1	1	1			
7. Tiligulskii and Berezanskii Limans																		
Tiligulskii Liman		1	1	1	1	1	1	1	1	1		1						
Berezanskii Liman		1	1	1														
Tiligulsko-Berezanskie Wetlands																1		
8. Dniepro–Bugskie Wetlands																		
Dniepro–Bugskii Liman				1	1	1	1		1	1		1						
Dniepro-Bugskie Wetlands													1		1	1	1	1
9.Tendrovsko–Yagorlytskie Wetlands																		
Black Sea State Biosphere Reserve	1	1				1	1	1										
Yagorlytskii Bay				1					1	1		1						
Tendrovskii Bay		1	1	1					1	1								
Tendrovsko–Yagorlytskie Wetlands													1	1	1	1	1	1
10. Dzharylgachskii Bay						1		1	1	1			1	1	1	1	1	1
11. Northern part of Karkinitskii Bay														1				
13. Tarkhankut Wetlands																		
Donuzlav Lake								1							1		1	
Tarkhankut Wetlands												1						
14. Western coast of Crimea																		
Sasyk Lake (Crimea)								1			1							
Western coast of Crimea											1						1	
15. Southern coast of Crimea																		
Sevastopol bays									1									
Southern coast of Crimea							1						1		1	1		
Southern coast of Crimea: Karadag–Lisaya Inlet							1	1			1	1						
16. Southern wetlands of Kerch peninsula																		
Feodosiya Bay							1	1										
Southern wetlands of Kerch peninsula											1	1				1		
17. Northern wetlands of Kerch peninsula																		
Achi Lake											1							
Akmonaiskoe Lake							1	1			1							
Aktashskoe Lake											1							
Adzihol Lake							1	1										
Northern wetlands of Kerch peninsula											1	1		1		1	1	
18. Crimean Mountain Wetlands																		

Simferopolskoe Water Reservour																	1	1
Koktebel Basins							1	1										
Barakol Lake							1	1				1						
Crimean Mountain Wetlands																		
19. Crimean Plain Wetlands																		
Mezhgornoe Water Reservour							1	1										
20. Southern part of Eastern Sivash											1	1		1	1		1	
21. Northern part of Eastern Sivash							1			1		1		1	1	1	1	1	1
20. Southern part of Eastern Sivash + 21. Northern part of Eastern Sivash		1							1			1	1						
22. Southern part of Central Sivash										1				1	1				
23. Northern part of Central Sivash							1					1		1	1	1	1	1	1
22. Southern part of Central Sivash + 23. Northern part of Central Sivash		1							1			1	1						
24. Western Sivash		1							1	1		1	1	1	1				
25. Utlyukskie Wetlands																			
Utlukskii & Sivashik Limans																1	1		
Utlukskii Liman		1					1		1	1		1			1				
Frunzenskoe Lake							1												
26. Molochanskiye Wetlands																			
Molochnyi Liman		1				1	1	1	1	1	1	1	1	1	1	1	1	1	1
27. Northern Priazovie																			
Obitochnaya Spit & Bay		1								1									
Berdianskaya Spit & Bay						1	1	1											
Northern Priazovie															1	1	1	1	
TOTAL	**1**	**18**	**11**	**15**	**16**	**19**	**32**	**27**	**24**	**23**	**10**	**22**	**4**	**14**	**16**	**14**	**15**	**13**	**9**

1.5. Species coverage and general count results

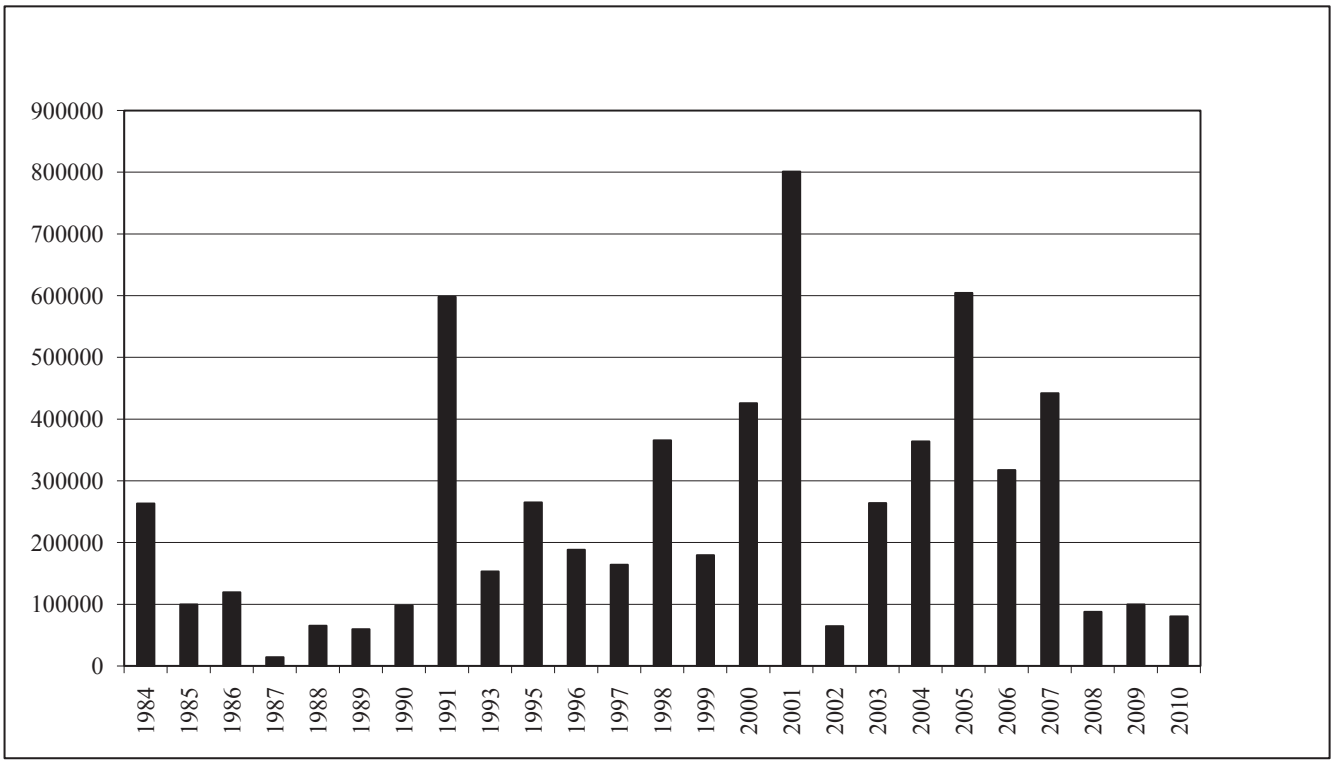
For the period 1984 – 2010 a total of 6,168,878 birds of 90 waterbird species have been counted, with numbes ranging from 14,053 in 1987 to 801,161 in 2001 (Pic.4). The number of birds per year was dependent on two factors – weather conditions and spatial coverage. Spatial coverage can be described by two key parameters – number of key sites counted per year and coverage of each concrete wetland included in counts. The first index is clearer from existing data, excluding cases where information has been combined for several big wetlands in one pool, and reported as a whole. The influence of the second indicator on count results is impossible to evaluate since the collection from the counters of maps showing count coverage for each wetland was only begun in the last few years. This last indicator is really important for large wetlands, but all key wetlands along the Ukrainian Black Sea coast are large.

Among the most numerous species observed during IWC were *Anas platyrhynchos* (1,464,354 birds / 23.7%) and Anser *albifrons* (1,418,728 / 23.0%).

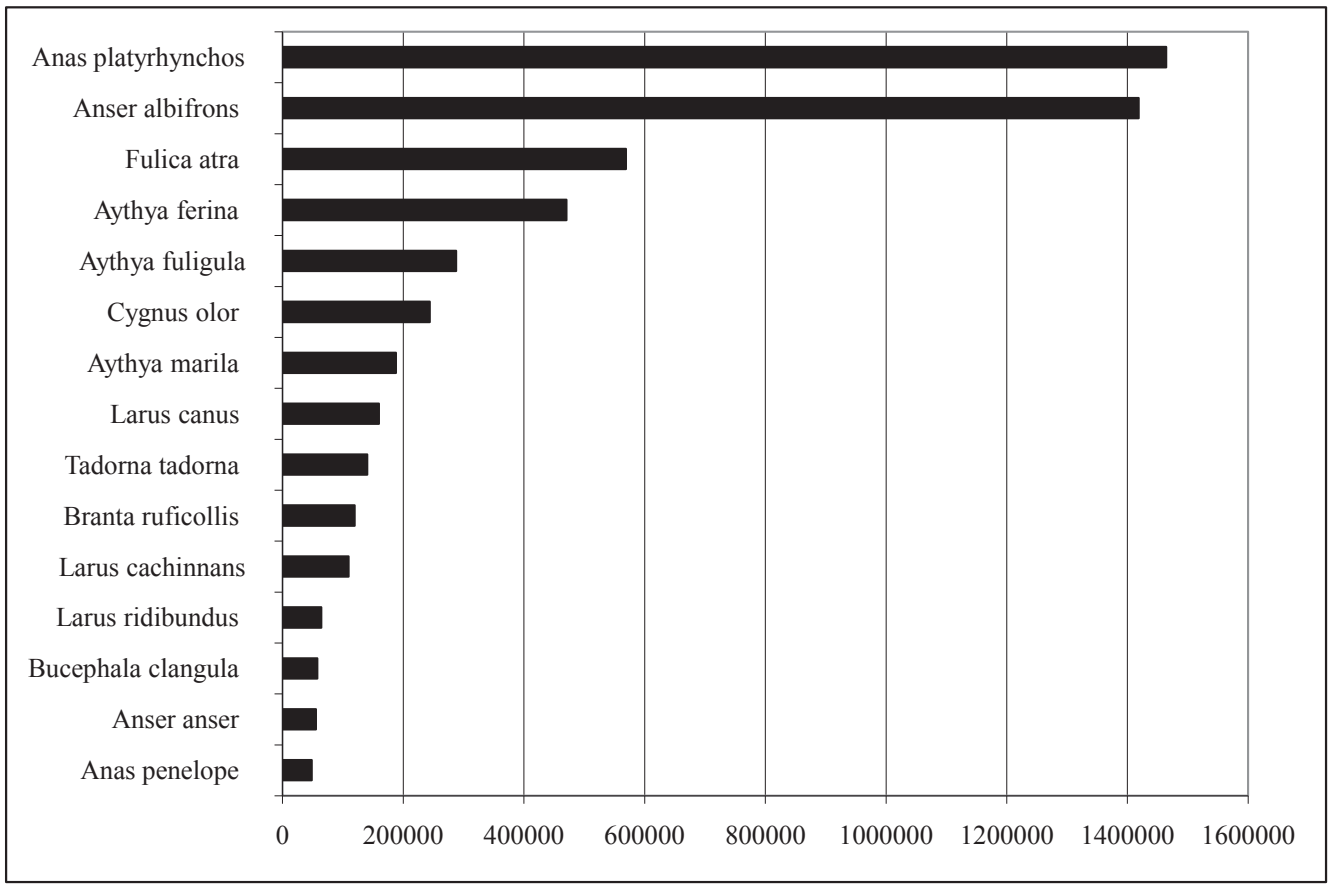
The followings 9 species were much less common, but nevertheless total for each of these species exceed 100 thousand birds: *Fulica atra* – 569,201, *Aythya ferina* – 470,361, *Aythya fuligula* – 287,705, *Cygnus olor* – 243,904, *Aythya marila* – 187,916, *Larus canus* – 159,801, *Tadorna tadorna* – 140,471, *Branta ruficollis* – 119,352, *Larus cachinnans* – 109,261 (Pic.5, Table 3).

Beside waterbirds, 1407 individuals of the wetland–dependent raptor *Haliaeetus albicilla* were counted. Other species of raptors and passerines were not included in the report since only some of the counters count them and the data don't reflect the real picture.

Comparison of the ratios of different taxonomic groups shows that the most numerous is Anseriformes



Pic.4 Number of waterbirds during the IWC 1984 – 2010



Pic. 5 The most common waterbird species observed at sites along the Ukraine coast

– 5,197,470 / 84.25% birds. Much less numerous are Gruiformes – 571,513 / 9.26% and Charadriiformes – 363,475 / 5.89%. Other bird orders were represented only by a small number of birds – Pelecaniformes – 20,292 /0.33%, Podicipediformes – 12,344 / 0.20%, Ciconiiformes – 3,545 / 0.06% , Gaviiformes – 238 /0.01% and Procellariiformes – 1 / <0.01%

Table 3. The total numbers of birds counted for period 1984 – 2010

Order	Family	Species name	Total	%
Gaviiformes	Gaviidae	Gavia stellata	3	<0.01
Gaviiformes	Gaviidae	Gavia arctica	235	<0.01
		Sub–total	***238***	***<0.01***
Podicipediformes	Podicipedidae	Tachybaptus ruficollis	3543	0.06
Podicipediformes	Podicipedidae	Podiceps nigricollis	3150	0.05
Podicipediformes	Podicipedidae	Podiceps auritus	44	<0.01
Podicipediformes	Podicipedidae	Podiceps grisegena	264	<0.01
Podicipediformes	Podicipedidae	Podiceps cristatus	5247	0.09
Podicipediformes	Podicipedidae	Podicipedidae spp.	96	<0.01
		Sub–total	***12344***	***0.20***
Procellariiformes	Procellariidae	Puffinus puffinus	1	<0.01
		Sub–total	***1***	***<0.01***
Pelecaniformes	Pelecanidae	Pelecanus crispus	162	<0.01
Pelecaniformes	Phalacrocoracidae	Phalacrocorax carbo	10594	0.17
Pelecaniformes	Phalacrocoracidae	Phalacrocorax aristotelis	506	0.01
Pelecaniformes	Phalacrocoracidae	Phalacrocorax pygmaeus	9028	0.15
Pelecaniformes	Phalacrocoracidae	Phalacrocorax spp.	2	<0.01
		Sub–total	***20292***	***0.33***
Ciconiiformes	Ardeidae	Botaurus stellaris	150	<0.01
Ciconiiformes	Ardeidae	Nycticorax nycticorax	24	<0.01
Ciconiiformes	Ardeidae	Bubulcus ibis	1	<0.01
Ciconiiformes	Ardeidae	Egretta alba	2062	0.03
Ciconiiformes	Ardeidae	Egretta garzetta	233	<0.01
Ciconiiformes	Ardeidae	Egretta/Bubulcus spp.	6	<0.01
Ciconiiformes	Ardeidae	Ardea cinerea	1066	0.02
Ciconiiformes	Ardeidae	Ardea purpurea	2	<0.01
Ciconiiformes	Ciconiidae	Ciconia ciconia	1	<0.01
		Sub–total	***3545***	***0.06***
Anseriformes	Anatidae	Branta leucopsis	14	<0.01
Anseriformes	Anatidae	Branta ruficollis	119352	1.94
Anseriformes	Anatidae	Anser anser	55252	0.90
Anseriformes	Anatidae	Anser albifrons	1418728	23.00
Anseriformes	Anatidae	Anser erythropus	1451	0.02
Anseriformes	Anatidae	Anser fabalis	369	0.01
Anseriformes	Anatidae	Anser caerulescens	9	<0.01
Anseriformes	Anatidae	Anser spp.	4298	0.07
Anseriformes	Anatidae	Cygnus olor	243904	3.95

Anseriformes	Anatidae	Cygnus cygnus	21740	0.35
Anseriformes	Anatidae	Cygnus columbianus	244	<0.01
Anseriformes	Anatidae	Cygnus spp.	34960	0.57
Anseriformes	Anatidae	Tadorna ferruginea	1269	0.02
Anseriformes	Anatidae	Tadorna tadorna	140471	2.28
Anseriformes	Anatidae	Anas platyrhynchos	1464354	23.74
Anseriformes	Anatidae	Anas crecca	8911	0.14
Anseriformes	Anatidae	Anas strepera	660	0.01
Anseriformes	Anatidae	Anas penelope	48213	0.78
Anseriformes	Anatidae	Anas acuta	6329	0.10
Anseriformes	Anatidae	Anas querquedula	810	0.01
Anseriformes	Anatidae	Anas clypeata	955	0.02
Anseriformes	Anatidae	Anatinae spp.	364202	5.90
Anseriformes	Anatidae	Netta rufina	19510	0.32
Anseriformes	Anatidae	Aythya ferina	470361	7.63
Anseriformes	Anatidae	Aythya nyroca	3335	0.05
Anseriformes	Anatidae	Aythya fuligula	287705	4.66
Anseriformes	Anatidae	Aythya marila	187716	3.04
Anseriformes	Anatidae	Aythya spp.	173198	2.81
Anseriformes	Anatidae	Clangula hyemalis	579	0.01
Anseriformes	Anatidae	Bucephala clangula	57649	0.94
Anseriformes	Anatidae	Somateria mollissima	2782	0.05
Anseriformes	Anatidae	Melanitta nigra	403	0.01
Anseriformes	Anatidae	Melanitta fusca	151	<0.01
Anseriformes	Anatidae	Oxyura leucocephala	1	0.00
Anseriformes	Anatidae	Mergellus albellus	42335	0.69
Anseriformes	Anatidae	Mergus serrator	7653	0.12
Anseriformes	Anatidae	Mergus merganser	7598	0.12
		Sub–total	***5197470***	***84.25***
Gruiformes	Gruidae	Grus grus	66	<0.01
Gruiformes	Rallidae	Rallus aquaticus	466	0.01
Gruiformes	Rallidae	Porzana porzana	4	<0.01
Gruiformes	Rallidae	Porzana parva	22	<0.01
Gruiformes	Rallidae	Gallinula chloropus	1754	0.03
Gruiformes	Rallidae	Fulica atra	569201	9.23
		Sub–total	***571513***	***9.26***
Charadriiformes	Charadriidae	Pluvialis squatarola	455	0.01
Charadriiformes	Charadriidae	Pluvialis apricaria	1	<0.01
Charadriiformes	Charadriidae	Charadrius hiaticula	3	<0.01
Charadriiformes	Charadriidae	Charadrius alexandrinus	1	<0.01
Charadriiformes	Charadriidae	Vanellus vanellus	15	<0.01
Charadriiformes	Charadriidae	Vanellus leucurus	1	<0.01
Charadriiformes	Charadriidae	Arenaria interpres	2	<0.01

Charadriiformes	Charadriidae	Recurvirostra avosetta	7	<0.01
Charadriiformes	Haemotopidae	Haematopus ostralegus	26	<0.01
Charadriiformes	Scolopacidae	Tringa ochropus	24	<0.01
Charadriiformes	Scolopacidae	Tringa totanus	7	<0.01
Charadriiformes	Scolopacidae	Tringa spp.	105	<0.01
Charadriiformes	Scolopacidae	Philomachus pugnax	4	<0.01
Charadriiformes	Scolopacidae	Calidris alpina	5256	0.09
Charadriiformes	Scolopacidae	Calidris canutus	222	<0.01
Charadriiformes	Scolopacidae	Calidris alba	213	<0.01
Charadriiformes	Scolopacidae	Calidris spp.	616	0.01
Charadriiformes	Scolopacidae	Lymnocryptes minimus	3	<0.01
Charadriiformes	Scolopacidae	Gallinago gallinago	44	<0.01
Charadriiformes	Scolopacidae	Scolopax rusticola	7	<0.01
Charadriiformes	Scolopacidae	Numenius arquata	1153	0.02
Charadriiformes	Scolopacidae	Numenius phaeopus	4	<0.01
Charadriiformes	Scolopacidae	Numenius spp.	51	<0.01
Charadriiformes	Scolopacidae	Limosa limosa	2	<0.01
Charadriiformes		Charadrii spp.	24	<0.01
Charadriiformes	Laridae	Larus ichthyaetus	4101	0.07
Charadriiformes	Laridae	Larus melanocephalus	89	<0.01
Charadriiformes	Laridae	Larus minutus	1311	0.02
Charadriiformes	Laridae	Larus ridibundus	64349	1.04
Charadriiformes	Laridae	Larus genei	220	<0.01
Charadriiformes	Laridae	Larus fuscus	81	<0.01
Charadriiformes	Laridae	Larus argentatus	86	<0.01
Charadriiformes	Laridae	Larus cachinnans	109261	1.77
Charadriiformes	Laridae	Larus canus	159801	2.59
Charadriiformes	Laridae	Larus spp.	15924	0.26
Charadriiformes	Laridae	Sterna sandvicensis	6	<0.01
		Sub–total	***363475***	***5.89***
		TOTAL	**6168878**	**100.00**
Falconiformes	Accipitridae	Haliaeetus albicilla	1407	
		TOTAL	**6170285**	

1.6. Waterbird count results for key coastal wetlands of Ukraine

In the course of conducting IWC in Ukraine a huge amount of information on wintering watebirds has been collected. For analysis of key sites only part of this data was used. The main reason for this is related to the question of combined count data. The basic methodological principle of IWC is site based counts, this means conducting long term counts using the same network of wetlands or their parts (for big wetlands). As was mentioned above, in Ukraine, which has a long sea coastline with many big wetlands, there is still no final delimitation of the count areas. Beside this, counters quite often submit information for several sites together and from year to year such combinations may be different (see Table 2).

For example for the Black Sea Biosphere Reserve, count reports for 1984 – 1991 refer to "Black Sea Reserve" that is possibly Yagorlytskii and Tendorvskii Bays, but also may include some other areas.

More recent data – 2006 – 2010 refer to "Tendrovsko–Yagorlytskie Wetlands", which includes both bays. Another example is the Dniester Wetlands, which has been counted from 1991 and includes several limans. For some years reports refer to "Kuchurganskii Liman", for other ones – "Kuchurganskii Liman and Dniester Delta". In some cases the situation is even more complicated – there are reports both for "Kuchurganskii Liman" and "Kuchurganskii Liman and Dniester Delta", submitted by different counters. In other years reports refer to "Dniester Wetlands, but for 1991, 1993, 1995 and 1996 they do not include Budakskii and Gribovskii Limans, but the same "Dniester Wetlands" in 2006 - 2010 include both of these limans. A similar situation exists for the largest coastal wetland complex of Ukraine – Sivash.

To describe count results for key sites, from the collected information were selected only series of count results which are related to concrete wetlands or sometimes a group of adjacent wetlands. Very small sites were excluded. Location of count sites is presented in Pic.6.

1.6.1. Western Pridunavie

1.6.1.1. Kagul, Kugurlui and Yalpug Lakes

Over the period of IWC counts in the region, this site was counted 6 times (Table 4), during which 29 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Стойловский, 2003; Стойловский, Кивганов, 2009). The average number of birds per count was 5,276 (R= 910 – 14,680). The average number of species was – 13.5 (R= 8 – 23). The most numerous species were *Anser albifrons* (A= 3,718; R= 100 – 10,200), *Anas platyrhynchos* (A= 736; R= 0 – 4,095), *Cygnus olor* (A= 252; R= 0 – 870) and *Fulica atra* (A= 187; R= 0 – 300).

Table 4. The number of waterbird species observed at Kagul, Kugurlui and Yalpug Lakes

N	Species	1995	1996	1997	1998	2003	2006
1.	Podiceps grisegena		5				
2.	Podiceps cristatus		5				
3.	Phalacrocorax carbo	24	5	4			17
4.	Phalacrocorax pygmaeus	68	275	5			13
5.	Botaurus stellaris		15	1			3
6.	Nycticorax nycticorax		2				
7.	Egretta alba	1	3		10		7
8.	Egretta garzetta						2
9.	Ardea cinerea		10		19		6
10.	Branta ruficollis		60		150	180	9
11.	Anser anser				16	452	59
12.	Anser albifrons	100	5500	500	1000	5008	10200
13.	Anser caerulescens		1				
14.	Cygnus olor	540	870	10	26	4	72
15.	Cygnus cygnus	25	60		8		
16.	Anas platyrhynchos		20	60	300		4095
17.	Netta rufina	55					
18.	Aythya ferina		120			3	2
19.	Aythya nyroca		15				
20.	Aythya fuligula		130				9
21.	Aythya marila	30		5			

22.	Bucephala clangula						6
23.	Mergellus albellus		55				
24.	Haliaeetus albicilla		3		7		6
25.	Gallinula chloropus		2				
26.	Fulica atra	130	300	300	300		92
27.	Larus ridibundus			5		4	35
28.	Larus fuscus	25					
29.	Larus cachinnans		40	20		1	21
30.	Larus canus	50	30			5	26
	Total number of birds	**1048**	**7526**	**910**	**1836**	**5657**	**14680**
	Total number of species	**11**	**23**	**10**	**10**	**8**	**19**

1.6.2. Eastern Pridunavie

1.6.2.1. Katlabukh, Safiany and Kitai Lakes

Over the period of IWC counts in the region, this site was counted 4 times (Table 5), during which 26 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998). The average number of birds per count was 27,002 (R= 3,364 – 76,535). The average number of species was – 12 (R= 5 – 16). The most numerous species were *Anser albifrons* (A= 20,882; R= 530 – 70,000), *Anas platyrhynchos* (A= 4,730; R= 130 –14,130), *Branta ruficollis* (A= 325; R= 100 – 1,000), *Anser anser* (A= 310; R= 0 – 920).

Table 5. The number of waterbird species observed at Katlabukh, Safiany and Kitai Lakes

N	Species	1995	1996	1997	1998
1.	Tachybaptus ruficollis	2			
2.	Podiceps nigricollis	5			
3.	Podiceps grisegena	5			
4.	Phalacrocorax carbo	200	60	25	3
5.	Phalacrocorax pygmaeus	150	45		
6.	Egreatta alba		7		40
7.	Ardea cinerea				15
8.	Branta ruficollis	1000	100	100	100
9.	Anser anser	300		20	920
10.	Anser albifrons	70000	8000	5000	530
11.	Anser erythropus	7			
12.	Cygnus olor	470	160		122
13.	Cygnus cygnus	20	20		442
14.	Tadorna ferruginea	80			
15.	Anas platyrhynchos	3650	14130	130	1010
16.	Anas acuta				18
17.	Netta rufina	45			
18.	Aythya ferina	600			
19.	Mergellus albellus		115		

20.	Mergus serrator		15		
21.	Mergus merganser		46		
23.	Haliaeetus albicilla	1			6
24.	Fulica atra		5		
25.	Larus ichthyaetus				30
26.	Larus cachinnans		120		128
27.	Larus canus		9		
	Total number of birds	**76535**	**22832**	**5275**	**3364**
	Total number of species	**16**	**14**	**5**	**13**

1.6.3. Danube Wetlands

1.6.3.1. Danube Delta

Over the period of IWC counts in the region, this site was counted 8 times (Table 6), during which 55 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Жмуд, 1999, 2001; Яковлев, 2011). The average number of birds per count was – 22,182 (R= 12,205 – 40,656). The average number of species was – 27.4 (R= 9 – 47). The most numerous species were *Anas platyrhynchos* (A= 5,194; R= 1,023 – 10,840), *Aythya ferina* (A= 4,999; R= 300 – 11,625), *Aythya fuligula* (A= 2,358; R= 0 – 7,370), *Anser anser* (A= 1,718; R= 0 – 4,480), *Anser albifrons* (A= 1,596; R= 0 – 6,700), *Cygnus olor* (A=1,511; R= 454 – 2,380).

Table 6. The number of waterbird species observed in the Danube Delta

N	Species	1991	1993	1996	1997	1998	1999	2000	2009
1.	Gavia arctica					1	1		
2.	Tachybaptus ruficollis			20	8	1	5	10	
3.	Podiceps nigricollis			34	12	8	68	4	5
4.	Podiceps grisegena			4			3	1	
5.	Podiceps cristatus			58	74		13	3	17
6.	Podicipedidae spp.								16
7.	Pelecanus crispus					1	1		
8.	Phalacrocorax carbo	30	150	520	463	138	179	291	140
9.	Phalacrocorax pygmaeus		43	1320	200	393	301	984	169
10.	Botaurus stellaris			5	5	2	12	2	
11.	Nycticorax nycticorax						3		
12.	Egretta alba	30	6	5	2	55	8	45	
13.	Egretta garzetta								34
14.	Ardea cinerea		10	10	1	17	2	32	15
15.	Branta leucopsis					4	4	6	
16.	Branta ruficollis					55			
17.	Anser anser		442	2700	646	454	1974	4480	3050
18.	Anser albifrons	4000	6700	630	1100	80	95	165	
19.	Anser caerulescens							1	

20.	Cygnus olor	1930	2380	1930	1817	1100	537	1939	454
21.	Cygnus cygnus			1250	1599	820	457	1059	161
22.	Tadorna tadorna	200		30		5	12	129	32
23.	Anas platyrhynchos	8000	10840	5860	1023	1610	1974	9882	2359
24.	Anas crecca					6	16	675	85
25.	Anas strepera								10
26.	Anas penelope	400			45	120	55	113	
27.	Anas acuta			70	3	45	1	58	
28.	Anas querquedula				10				
29.	Aythya ferina	500	7900	300	11496	2900	4174	11625	1100
30.	Aythya nyroca							1	4
31.	Aythya fuligula		2000	320	7370	3870	1015	1227	3063
32.	Aythya marila				120		6		
33.	Clangula hyemalis						6		
34.	Bucephala clangula			150			1287	2565	12
35.	Mergellus albellus			470	356	15	592	2115	345
36.	Mergus serrator				60		22		
37.	Mergus merganser			35	14	7	11	199	4
38.	Haliaeetus albicilla		2	23		24	21	28	
39.	Rallus aquaticus						2	3	
40.	Gallinula chloropus			6	5		5	8	
41.	Fulica atra	1000	2	850	79	1140	344	1307	355
42.	Pluvialis squatarola						2		
43.	Vanellus vanellus						1		
44.	Recurvirostra avosetta					3			
45.	Haematopus ostralegus				1				
46.	Calidris alpina					120	25	6	
47.	Calidris alba					100	36	23	
48.	Gallinago gallinago						1		
49.	Scolopax rusticola						1		
50.	Numenius arquata			1	7	15	124	51	4
51.	Larus ichthyaetus			1	4	480	2	1	
52.	Larus melanocephalus								16
53.	Larus minutus						3		
54.	Larus ridibundus				60		445	620	79
55.	Larus fuscus						2		
56.	Larus cachinnans		800	1400	660	1250	3297	894	676
57.	Larus canus					6	5	104	
	Total number of birds	**16090**	**31275**	**18002**	**27240**	**14845**	**17150**	**40656**	**12205**
	Total number of species	**9**	**13**	**27**	**29**	**33**	**47**	**37**	**24**

1.6.3.2. Stentsovsko–Zhebrianovskie Plavni

Over the period of IWC counts in the region, this site was counted 6 times (Table 7), during which 31 waterbird species were observed (Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002). The average number of birds per count was – 20,430 (R= 486 – 46,648). The average number of species was – 16.2 (R= 10 – 24). The most numerous species were *Anser albifrons* (A= 15,610; R= 0 – 40,000), *Anas platyrhynchos* (A= 2,810; R= 110 – 7,140), *Anser anser* (A= 711; R= 0 – 3,750), *Cygnus olor* (A= 426; R = 13 – 1,290), *Branta ruficollis* (A= 273; R= 0 – 815).

Table 7. The number of waterbird species observed in the Stentsovsko–Zhebrianovskie Plavni

N	Species	1996	1997	1998	1999	2000	2001
1.	Tachybaptus ruficollis						30
2.	Podiceps grisegena	8					
3.	Podiceps cristatus		1				
4.	Phalacrocorax carbo	70	45	40	83	76	5
5.	Phalacrocorax pygmaeus	300	41		77	237	25
6.	Botaurus stellaris	5	5			2	
7.	Nycticorax nycticorax	2	2	1			
8.	Egretta alba	10	3	2	6	1	24
9.	Ardea cinerea	5	11	1	2		5
10.	Branta ruficollis	700	120		815		
11.	Anser anser	280	100	110	3750	25	
12.	Anser albifrons	40000	21000	660	27000		5000
13.	Anser erythropus				7		
14.	Cygnus olor	1000	30	1290	140	13	83
15.	Cygnus cygnus	200	17	8	35		
16.	Anas platyrhynchos	3100	4500	1650	7140	110	360
17.	Netta rufina			5			
18.	Aythya ferina	600	75	10			10
19.	Aythya nyroca		2				
20.	Aythya fuligula	200	46				
21.	Aythya marila	30					
22.	Mergellus albellus	80	14				
23.	Mergus serrator		1				
24.	Mergus merganser		2				
25.	Haliaeetus albicilla	11		3	2	1	
26.	Gallinula chloropus	2				1	
27.	Fulica atra	4	5	60	29		6
28.	Numenius arquata		4				
29.	Larus ichthyaetus			120			
30.	Larus ridibundus		30		150		
31.	Larus cachinnans	40	50	98	300	20	200
32.	Larus canus	1	1				
	Total number of birds	**46648**	**26105**	**4058**	**39536**	**486**	**5748**
	Total number of species	**22**	**24**	**15**	**15**	**10**	**11**

1.6.4. Tuzlovskie Limans

1.6.4.1. Sasyk Liman and adjacent area

Over the period of IWC counts in the region, this site was counted 10 times (Table 8), during which 32 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Пилюга, Тилле, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002). The average number of birds per count was – 18,521 (R= 5,551 – 39,171). The average number of species was – 13.5 (R = 7 – 21). The most numerous species were *Anser albifrons* (A= 8,958; R= 1,000 – 20,000), *Aythya ferina* (A= 3,545; R= 0 – 10,000), *Anas platyrhynchos* (A= 2,293; R= 55 – 14,000), *Aythya fuligula* (A= 1,014; R= 0 – 6,000), *Fulica atra* (A= 746; R= 0 – 7,000).

Table 8. The number of waterbird species observed at Sasyk Liman

N	Species	1991	1993	1995	1996	1997	1998	1998	1999	2000	2001
1.	Podiceps nigricollis						15		2		
2.	Podiceps grisegena								1		
3.	Podiceps cristatus				15	4	4				
4.	Phalacrocorax carbo	100		5			4				
5.	Phalacrocorax pygmaeus			140	20				13	2	240
6.	Nycticorax nycticorax							1			
7.	Egretta alba							3			27
8.	Ardea cinerea				1			1			
9.	Branta ruficollis			2000		30	8	80	45	250	600
10.	Anser anser	90		200					500		
11.	Anser albifrons	20000	16000	10000	3500	20000	1850	2030	6200	1000	9000
12.	Anser erythropus				2	2				50	
13.	Anser fabalis								3		
14.	Cygnus olor	351	90	450	600	876	36	770	400	47	475
15.	Cygnus cygnus			20	40	114	271	317	300	10	
16.	Tadorna tadorna	20	30	25			5		60		30
17.	Anas platyrhynchos	14000	140	130	280	55	77	510	1500	120	6120
18.	Anas acuta						18				
19.	Aythya ferina	4600	6200	7000	650		1500	3000	10000	2000	500
20.	Aythya nyroca			3					10		
21.	Aythya fuligula	3000			70		55	1000	6000	2000	
22.	Aythya marila				20						
23.	Bucephala clangula	8					1200				
24.	Mergellus albellus			80	2700	2700	150	180			
25.	Mergus serrator		180				43	24			
26.	Mergus merganser			80			60	4	120		
27.	Haliaeetus albicilla		5	3	2		16	15	6	3	

28.	Fulica atra	10		40	100	100	7		7000		200
29.	Pluvialis squatarola						2				
30.	Larus ichthyaetus							128			
31.	Larus ridibundus					15	30		970	100	
32.	Larus cachinnans			70	20	200	200	98	600	50	770
33.	Larus canus					20	400				
	Total number of birds	**39171**	**22645**	**20246**	**8020**	**24116**	**5551**	**8161**	**33730**	**5632**	**17962**
	Total number of species	**8**	**7**	**16**	**15**	**11**	**21**	**16**	**19**	**12**	**10**

1.6.4.2. Shagany, Alibei and Burnas Limans

Over the period of IWC counts in the region, this site was counted 9 times (Table 9), during which 27 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002). The average number of birds per count was – 36,501 (R= 6,575 – 84,677). The average number of species was – 10.4 (R = 7 – 16). The most numerous species were *Anser albifrons* (A= 15,987; R = 500 – 40,000), *Aythya ferina* (A=10,659; R= 0 – 43,000), *Aythya fuligula* (A= 6,462; R= 0 – 26000), *Branta ruficollis* (A=1,680; R= 0 – 7,000), *Anas platyrhynchos (*A= 456; R= 0 – 1,500), *Cygnus olor* (A= 339; R= 0 – 1,160).

Table 9. The number of waterbird species observed at Shagany, Alibei and Burnas Limans

N	Species	1991	1993	1995	1996	1997	1998	1999	2000	2001
1.	Podiceps nigricollis				1	10	10			
2.	Podiceps cristatus				11					
3.	Egretta alba	12	5	2						
4.	Ardea cinerea		5							
5.	Branta ruficollis			2500	460	120	7000	40		5000
6.	Anser anser			600			40		20	35
7.	Anser albifrons	500	9500	21300	23500	19500	18000	6580	5000	40000
8.	Anser erythropus						1			
9.	Cygnus olor	950	255	1160	500			150		38
10.	Cygnus cygnus			100	80	10	10			
11.	Tadorna tadorna	340	80	820	280		24			200
12.	Anas platyrhynchos	1500	280	560	900		120	180	60	500
13.	Anas acuta	100								
14.	Aythya ferina	600	640	43000	20000	690	4000	7000	20000	
15.	Aythya fuligula		160	14000	1000	2500	6000	8500	26000	
16.	Aythya marila				500					
17.	Bucephala clangula		8							
18.	Mergellus albellus				5	544				
19.	Mergus serrator	10	3			10				
20.	Mergus merganser				80					
21.	Haliaeetus albicilla	3			21		4	2	2	3

22.	Fulica atra		12	5						
23.	Calidris alpina			150						
24.	Calidris canutus			55						
25.	Calidris spp.	100								
26.	Larus ridibundus	460		370						
27.	Larus genei			5						
28.	Larus cachinnans		250	50				280	10	530
29.	Larus spp.	2000								
	Total number of birds	**6575**	**11198**	**84677**	**47338**	**23384**	**35209**	**22732**	**51092**	**46306**
	Total number of species	**10**	**12**	**16**	**14**	**8**	**11**	**8**	**7**	**8**

1.6.5. Dniester Wetlands

1.6.5.1 Budakskii and Gribovskii Limans

Over the period of IWC counts in the region, this site was counted 9 times (Table 10), during which 15 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002). The average number of birds per count was – 9,550 (R= 1,150 – 26,540). The average number of species was – 5.3 (R= 4 – 7). The most numerous species were *Aythya ferina (*A= 5,514; R= 0 – 20,100), *Aythya fuligula* (A= 1,759; R= 0 – 10,000), *Fulica atra* (A= 637; R= 0 – 5,080), *Anser albifrons* (A= 569; R= 0 – 5,000), *Cygnus olor (*A= 341; R= 2 – 700), *Anas platyrhynchos* (A= 248; R= 0 – 900).

Table 10. The number of waterbird species observed at Budakskii and Gribovskii Limans

N	Species	1991	1993	1995	1996	1997	1998	1999	2000	2001
1.	Podiceps cristatus					50				
2.	Egretta alba	25								
3.	Branta ruficollis						1500			
4.	Anser albifrons						5000	120		
5.	Cygnus olor	615	280	700	600	600	40	2	36	195
6.	Cygnus cygnus			30	150		130	105		
7.	Anas platyrhynchos	720	900		200			50	15	350
8.	Anas penelope					10				
9.	Aythya ferina	20100	4400	6100	2500	8370		160	8000	
10.	Aythya fuligula		1100	400	1200	3130			10000	
11.	Aythya marila				50					
12.	Bucephala clangula					20				
13.	Haliaeetus albicilla			1						
14.	Fulica atra	5080						50		600
15.	Larus ridibundus		80					2030		

16.	Larus cachinnans		150						5	5
	Total number of birds	**26540**	**6910**	**7231**	**4700**	**12180**	**6670**	**2517**	**18056**	**1150**
	Total number of species	**5**	**6**	**5**	**6**	**6**	**4**	**7**	**5**	**4**

1.6.5.2. Dniester Liman

Over the period of IWC counts in the region, this site was counted 6 times (Table 11), during which 18 waterbird species were observed (Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002). The average number of birds per count was – 13,657 (R= 125 – 63,020). The average number of species was – 5.6 (R= 2 – 8). The most numerous species were *Anser albifrons* (A= 8,350; R= 0 – 50,000), *Branta ruficollis* (A= 2,000; R= 0 – 12,000), *Aythya ferina* (A= 1,858; R= 0 – 10000) and *Aythya fuligula* (A= 600; R= 0 – 2000),

Table 11. The number of waterbird species observed at the Dniester Liman

N	Species	1996	1997	1998	1999	2000	2001
1.	Podiceps cristatus	50					
2.	Podiceps nigricollis				15		
3.	Egretta alba						5
4.	Ardea cinerea						3
5.	Branta ruficollis						12000
6.	Anser albifrons		50	50			50000
7.	Anser erythropus						1000
8.	Cygnus olor	30	2	10			12
9.	Cygnus cygnus			30	250		
10.	Anas platyrhynchos	400	100	100	60		
11.	Aythya ferina	10000	500	500	150		
12.	Aythya fuligula	2000	1000	500	100		
13.	Aythya marila	300					
14.	Bucephala clangula					25	
15.	Mergellus albellus	1500		200			
16.	Fulica atra	100					
17.	Larus ridibundus				800		
18.	Larus cachinnans					100	
	Total number of birds	**14380**	**1652**	**1390**	**1375**	**125**	**63020**
	Total number of species	**8**	**5**	**7**	**6**	**2**	**6**

1.6.5.3. Dniester Delta and Kuchurganskii Liman

Over the period of IWC counts in the region, this site was counted 6 times (Table 12), during which 21 waterbird species were observed (Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002). The average number of birds per count was – 6,929 (R= 1,131 – 13,346). The average number of species

was – 11.3 (R= 8 – 15). The most numerous species were *Fulica atra* (A= 4,550; R= 0 – 12,000), *Anser albifrons* (A= 1,467; R= 50 – 5,000) and *Anas platyrhynchos* (A= 348; R= 50 – 800).

Table 12. The number of waterbird species observed at the Dniester Delta and Kuchurganskii Liman

N	Species	1996	1997	1998	1999	2000	2001
1.	Tachybaptus ruficollis			1			
2.	Podiceps cristatus						5
3.	Phalacrocorax pygmaeus				18		
4.	Botaurus stellaris	1	1			2	10
5.	Nycticorax nycticorax		3				
6.	Egretta alba	30	8	12	15	13	137
7.	Ardea cinerea	20	15	15	25	21	127
8.	Branta ruficollis			100			80
9.	Anser anser						5
10.	Anser albifrons		50	3000	150	600	5000
11.	Anser erythropus					5	
12.	Cygnus olor	30		50	6		55
13.	Anas platyrhynchos	100	800	50	300	615	220
14.	Aythya ferina	500			500		
15.	Aythya fuligula	50	200		100		
16.	Mergellus albellus		70				
17.	Haliaeetus albicilla				17	3	5
18.	Gallinula chloropus					10	12
19.	Fulica atra		5500	2000	4000	12000	3800
20.	Larus ridibundus	200	250		5	9	200
21.	Larus cachinnans	100	20		100	68	12
22.	Larus canus	100	50				2
	Total number of birds	**1131**	**6967**	**5228**	**5236**	**13346**	**9670**
	Total number of species	**10**	**12**	**8**	**12**	**11**	**15**

1.6.6. Odessa Limans

1.6.6.1. Sukhoi Liman

Over the period of IWC counts in the region, this site was counted 9 times (Table 13), during which 31 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002; Панченко, Форманюк, Корзюков и др., 2004). The average number of birds per count was – 5,201 (R= 1,548 – 10,222). The average number of species was – 16 (R= 13 – 19). The most numerous species were *Larus ridibundus* (A= 1,044; R= 0 – 3,200), Larus *cachinnans* (A= 773; R= 22 – 4,010), *Larus canus* (A= 691; R= 40 – 5,400), *Fulica atra* (A= 610; R= 200 – 1,730) and Aythya *ferina (*A= 607; R= 8 – 3,200).

Table 13. The number of waterbird species observed at Sukhoi Liman

N	Species	1991	1993	1996	1997	1998	1999	2000	2001	2003
1.	Tachybaptus ruficollis	40	39	30	30	52	68	83	38	68
2.	Podiceps nigricollis	11	83	50	10	7	18	12	12	3
3.	Podiceps grisegena	3	27	20	10	14	28			
4.	Podiceps cristatus	15	94	50	60	34	80	50	10	250
5.	Phalacrocorax carbo				1	2				
6.	Phalacrocorax pygmaeus						15			139
7.	Botaurus stellaris			1						
8.	Egretta alba	3								
9.	Anser albifrons				100	500				
10.	Anser spp.									63
11.	Cygnus olor	287	304	300	260	158	290	113	64	239
12.	Cygnus cygnus			10				1	1	5
13.	Anas platyrhynchos	730	102	200	200	181	240	413	325	1905
14.	Anas crecca							25	25	
15.	Anas penelope									2
16.	Anas acuta		1		3					
17.	Anas clypeata	1								
18.	Aythya ferina	226	144	3200	600	8	450	262	31	550
19.	Aythya nyroca	12								
20.	Aythya fuligula	45	567	900	100	110	840	546	34	639
21.	Aythya marila			100						
22.	Bucephala clangula				50		5	11	11	83
23.	Mergellus albellus			10	120			35	35	128
24.	Mergus serrator			30	2		3			31
25.	Haliaeetus albicilla									1
26.	Gallinula chloropus	2		2						
27.	Fulica atra	700	260	480	200	200	1350	271	300	1730
28.	Larus ichthyaetus					214				
29.	Larus ridibundus	2845	1200	1200	365		160	170	3200	263
30.	Larus fuscus	1								
31.	Larus cachinnans	75	800	500	85	22	350	114	1000	4010
32.	Larus canus	130	5400	50	50	46	90	40	300	113
	Total number of birds	**5126**	**9021**	**7133**	**2246**	**1548**	**3987**	**2146**	**5386**	**10222**
	Total number of species	**17**	**13**	**18**	**18**	**14**	**15**	**15**	**15**	**19**

1.6.6.2. Khadzibeiskii Liman

Over the period of IWC counts in the region, this site was counted 9 times (Table 14), during which were observed 27 waterbird species (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002). The average number of birds per count was – 2,425 (R= 298 – 8,814). The average number of species was – 10 (R= 4 – 16). The most numerous species were *Aythya ferina* (A= 590; R= 0 – 3,400), *Larus ridibundus* (A= 704; R= 0 – 3,000), *Larus cachinnans* (A= 423; R= 0 – 1,800).

Table 14. The number of waterbird species observed at Khadzibeiskii Liman

N	Species	1991	1993	1995	1996	1997	1998	1999	2000	2001
1.	Tachybaptus ruficollis			33	1			11	7	27
2.	Podiceps nigricollis			19	1					
3.	Podiceps grisegena		2	1						
4.	Podiceps cristatus			14						10
5.	Phalacrocorax pygmaeus				30					
6.	Botaurus stellaris				2	1				
7.	Egretta alba			1						1
8.	Branta ruficollis						20			
9.	Anser anser			60						
10.	Anser albifrons		35			30	1000			43
11.	Cygnus olor	5	10	410	30	2				
12.	Cygnus cygnus			10						
13.	Anas platyrhynchos	220	500	660	60	60	15	70	40	26
14.	Anas crecca									13
15.	Aythya ferina	200	80	3400	10	25	1500	100		
16.	Aythya nyroca			1						
17.	Aythya fuligula		20	1050			10	15		13
18.	Mergellus albellus		40		12	65				
19.	Mergus merganser			5						
20.	Rallus aquaticus								2	113
21.	Porzana parva								15	6
22.	Gallinula chloropus	200	10		40	90			41	132
23.	Fulica atra		5	450	50	10	12		2	5
24.	Tringa ochropus								2	
25.	Larus ridibundus		1600	1500	5	5		30	3000	200
26.	Larus cachinnans		40	1200	20	10		240	1800	500
27.	Larus canus				10				60	
	Total number of birds	**625**	**2342**	**8814**	**671**	**298**	**2557**	**466**	**4969**	**1089**
	Total number of species	**4**	**11**	**16**	**14**	**10**	**6**	**6**	**10**	**13**

1.6.6.3. Odessa Bay

Over the period of IWC counts in the region, this site was counted 8 times (Table 15), during which 33 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002; Панченко, Форманюк, 2004а). The average number of birds per count was – 5,906 (R= 267 – 26,857). The average number of species was – 11.9 (R= 4 – 23). The most numerous species were *Aythya fuligula* (A= 2,288; R= 0 – 14,159), *Aythya ferina* (A=1,402; R= 0 – 5,000), *Larus canus* (A= 867; R= 0 – 6,323), *Larus ridibundus* (A= 662; R= 0 – 2,376), *Larus cachinnans* (A= 201; R= 0 – 680).

Table 15. The number of waterbird species observed in Odessa Bay

N	Species	1995	1996	1997	1998	1999	2000	2001	2003
1.	Gavia arctica				3				
2.	Tachybaptus ruficollis		2				2		9
3.	Podiceps nigricollis		2		6	21		300	1
4.	Podiceps grisegena		1						
5.	Podiceps cristatus		6		35		10	50	35
6.	Pelecanus crispus					161			
7.	Phalacrocorax carbo						4		
8.	Phalacrocorax pygmaeus								59
9.	Botaurus stellaris								1
10.	Egretta alba								1
11.	Ardea cinerea							1	
12.	Anser albifrons			100					
13.	Anser caerulescens		2						
14.	Cygnus olor	150	50	25		8		10	11
15.	Tadorna tadorna			200				500	4
16.	Anas platyrhynchos			66		60	40	350	352
17.	Aythya ferina	5000	2500		500	480	1	100	2636
18.	Aythya nyroca					7			
19.	Aythya fuligula	2000	500	550	250	650		200	14159
20.	Bucephala clangula			100		8		4	64
21.	Somateria mollissima								5
22.	Mergellus albellus			65		23			37
23.	Mergus serrator					4		15	315
24.	Mergus merganser		10	20					2
25.	Haliaeetus albicilla						1		
26.	Rallus aquaticus								3
27.	Gallinula chloropus								68
28.	Fulica atra								27
29.	Tringa ochropus								4
30.	Larus ichthyaetus				450				
31.	Larus ridibundus	2000	200	50		510	15	150	2376
32.	Larus fuscus						4	4	

33.	Larus cachinnans		150	5	110	680	100	200	365
34.	Larus canus		50	5	30	350	90	90	6323
	Total number of birds	**9150**	**3473**	**1186**	**1384**	**2962**	**267**	**1974**	**26857**
	Total number of species	**4**	**12**	**11**	**8**	**13**	**10**	**14**	**23**

1.6.6.4. Kuyalnitskii Liman

Over the period of IWC counts in the region, this site was counted 10 times (Table 16), during which 18 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002; Форманюк, Гержик, 2004). The average number of birds per count was – 1,857 (R= 411 – 5,000). The average number of species was – 4.4 (R= 1 – 9). The most numerous species were *Tadorna tadorna* (A= 1,348; R= 275 – 5,000), *Anser albifrons* (A= 152; R= 0 – 1,500), *Larus ridibundus* (A= 100; R= 0 – 485).

Table 16. The number of waterbird species observed at Kuyalnitskii Liman

N	Species	1991	1993	1995	1996	1997	1998	1999	2000	2001	2003
1.	Tachybaptus ruficollis								65		
2.	Podiceps nigricollis							10			
3.	Podicipedidae spp.	80									
4.	Branta ruficollis						60				
5.	Anser anser										1
6.	Anser albifrons					20	1500				2
7.	Cygnus olor							4			
8.	Tadorna tadorna	2140	1200	700	275	1180	300	740	650	5000	1301
9.	Anas platyrhynchos				50	200	30	45	3		400
10.	Aythya ferina							100			
11.	Bucephala clangula							1			
12.	Haliaeetus albicilla								1		
13.	Gallinula chloropus								16		
14.	Fulica atra							50	18		
15.	Numenius arquata				1						
16.	Larus ichthyaetus						150				
17.	Larus ridibundus			170	15			300	485		29
18.	Larus cachinnans			155				400	127		11
19.	Larus canus				70				48		75
20.	Larus spp.	400									
	Total number of birds	**2620**	**1200**	**1025**	**411**	**1400**	**2040**	**1650**	**1413**	**5000**	**1819**
	Total number of species	**1**	**1**	**3**	**5**	**3**	**5**	**9**	**9**	**1**	**7**

1.6.6.5. Adzhalykskii Limans

Over the period of IWC counts in the region, this site was counted 7 times (Table 17), during which 29 waterbird species were observed (Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002; Форманюк, Панченко, Корзюков, 2004). The average number of birds per count was – 9,617 (R= 299 – 26,470). The average number of species was – 10,4 (R= 6 – 23). The most numerous species were *Aythya fuligula* (A= 3,032; R= 0 – 7,000), *Anas platyrhynchos* (A= 3,028; R= 19 –10,036), *Aythya ferina* (A=1,579; R= 0 – 3,551), *Larus cachinnans* (A= 828; R= 100 – 4,415), *Fulica atra* (A= 434; R= 0 – 2,732).

Table 17. The number of waterbird species observed at Adzhalykskii Limans

N	Species	1996	1997	1998	1999	2000	2001	2003
1.	Tachybaptus ruficollis							176
2.	Podiceps nigricollis	1						2
3.	Podiceps grisegena				5			
4.	Podiceps cristatus						10	129
5.	Phalacrocorax carbo							1
6.	Botaurus stellaris					1		
7.	Branta ruficollis			30				
8.	Anser anser							42
9.	Anser albifrons		60	800	40			
10.	Cygnus olor	300	9	360	900	189	19	344
11.	Cygnus cygnus				200			1
12.	Anas platyrhynchos	250	70	20	9000	1800	19	10036
13.	Anas crecca							1
14.	Anas penelope							12
15.	Anas acuta							1
16.	Aythya ferina	1500		500	3000	1500	1000	3551
17.	Aythya fuligula	200		7000	5200	2000	3000	3821
18.	Clangula hyemalis							1
19.	Bucephala clangula					1		410
20.	Somateria mollissima							1
21.	Mergellus albellus		5					171
22.	Mergus serrator							383
23.	Mergus merganser				50			3
24.	Haliaeetus albicilla					2		
25.	Rallus aquaticus						1	
26.	Gallinula chloropus						1	
27.	Fulica atra	200	5	1		100		2732
28.	Larus ridibundus					30	80	7
29.	Larus cachinnans	500	150	150	280	200	100	4415
30.	Larus canus					15		230
	Total number of birds	**2951**	**299**	**8861**	**18675**	**5838**	**4230**	**26470**
	Total number of species	**7**	**6**	**8**	**9**	**11**	**9**	**23**

1.6.7. Tiligulskii and Berezanskii Limans

1.6.7.1. Tiligulskii Liman

Over the period of IWC counts in the region, this site was counted 11 times (Table 18), during which 22 waterbird species were observed (WI IWC database; Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Русев, Корзюков, Сацык, 1999; Русев, Корзюков, Сацык и др., 2001; Русев, Корзюков, Форманюк и др., 2002; Форманюк, Панченко, 2004a). The average number of birds per count was – 6,873 (R= 90 – 55,536). The average number of species was – 6.6 (R= 2 – 17). The most numerous species were *Anas platyrhynchos* (A= 2,697; R= 3 – 25,230), *Larus cachinnans* (A= 1,127; R= 0 – 13,805), *Fulica atra* (A= 1,127; R= 0 – 12,400), *Aythya ferina* (A= 443; R= 0 – 2,000), *Aythya fuligula* (A= 405; R= 0 – 4,000).

Table 18. The number of waterbird species observed at Tiligulskii Liman

N	Species	1991	1993	1995	1996	1997	1998	1999	2000	2001	2003	2003
1.	Podiceps nigricollis									130		
2.	Podiceps cristatus	20								290		
3.	Botaurus stellaris								1	1		
4.	Egretta alba						1					
5.	Anser anser	10					2			18		
6.	Anser albifrons	500				80	300					
7.	Cygnus olor	280		470			300	30		231	8	11
8.	Cygnus cygnus			20								2
9.	Tadorna tadorna						15			18	11	
10.	Anas platyrhynchos	1230	480	1400	10	10	1100	70	120	25230	3	10
11.	Anas penelope						7					
12.	Anas acuta	60										
13.	Aythya ferina	100			160		1000	2000		100	12	1500
14.	Aythya fuligula	110			40		100	4000		200		4
15.	Bucephala clangula									930		
16.	Haliaeetus albicilla								1	1		
17.	Rallus aquaticus								7	1		
18.	Gallinula chloropus								2	1		
19.	Fulica atra									12400		
20.	Larus ichthyaetus						2000					
21.	Larus ridibundus		150	70					370	1665		
22.	Larus cachinnans			120			5		1525	13805	1	
23.	Larus canus						10		85	515	90	50
	Total number of birds	**2310**	**630**	**2080**	**210**	**90**	**4840**	**6100**	**2111**	**55536**	**125**	**1577**
	Total number of species	**8**	**2**	**5**	**3**	**2**	**12**	**4**	**8**	**17**	**6**	**6**

1.6.7.2. Berezanskii Liman

Over the period of IWC counts in the region, this site was counted 3 times (Table 19), during which 9 waterbird species were observed (WI IWC database). The average number of birds per count was – 2,878 (R= 1,390 – 5,400). The average number of species was – 4.7 (R= 3 – 8). The most numerous species

were *Aythya ferina* (A= 1,383; R= 150 – 3,200), *Larus ridibundus* (A= 667; R= 0 – 2,000), *Cygnus olor* (A= 370; R= 200 – 630), *Anas platyrhynchos* (A= 370; R= 0 – 800), *Larus cachinnans* (A= 33; R= 0 – 100).

Table 19. The number of waterbird species observed at Berezanskii Liman

N	Species	1991	1993	1995
1.	Cygnus olor	630	280	200
2.	Tadorna tadorna	15		
3.	Anas platyrhynchos	800	310	
4.	Aythya ferina	150	800	3200
5.	Aythya fuligula	40		
6.	Mergellus albellus	10		
7.	Fulica atra	20		
8.	Calidris spp.	80		
9.	Larus ridibundus			2000
10.	Larus cachinnans	100		
	Total number of birds	**1845**	**1390**	**5400**
	Total number of species	**8**	**3**	**3**

1.6.8. Dniepro–Bugskie Wetlands

1.6.8.1. Dniepro–Bugskii Liman

Over the period of IWC counts in the region, this site was counted 7 times (Table 20), during which 23 waterbird species were observed (WI IWC database, Русев, Жмуд, Корзюков и др., 1996, 1997, 1998; Руденко, Яремченко, 2001; Руденко, Яремченко, Москаленко, 2002; Петрович, 2004б). The average number of birds per count was – 4,107 (R= 274 – 17,220). The average number of species was – 6.9 (R= 3 – 11). The most numerous species were *Anser albifrons* (A= 1,000; R= 0 – 7,000), *Aythya fuligula* (A= 930; R= 0 – 3,000), *Bucephala clangula* (A= 546; R= 0 – 3,800), *Aythya ferina* (A= 493; R= 0 – 3,000) and *Anas platyrhynchos* (A= 417; R= 0 – 2,500).

Table 20. The number of waterbird species observed at the Dniepro–Bugskii Liman

N	Species	1995	1996	1997	1998	2000	2001	2003
1.	Podiceps cristatus					3		
2.	Branta ruficollis				80			
3.	Anser anser				800	86	120	
4.	Anser albifrons				7000			
5.	Cygnus olor	80	150	100	400			
6.	Cygnus cygnus				100			8
7.	Cygnus spp.					34	51	
8.	Anas platyrhynchos	270			2500	36	32	80
9.	Anas crecca						19	
10.	Anas strepera						12	

11.	Anas querquedula				300	3		
12.	Aythya ferina			400	3000			50
13.	Aythya fuligula		3000	500	3000	11		
14.	Clangula hyemalis							500
15.	Bucephala clangula					23		3800
16.	Somateria mollissima							1
17.	Melanitta nigra							300
18.	Melanitta fusca							150
19.	Mergellus albellus							50
20.	Mergus serrator					21		30
21.	Haliaeetus albicilla		4		30	6	3	3
22.	Fulica atra				10			
23.	Larus ridibundus	1500				7		
24.	Larus cachinnans					34	37	
25.	Larus canus					17		
	Total number of birds	**1850**	**3154**	**1000**	**17220**	**281**	**274**	**4972**
	Total number of species	**3**	**3**	**3**	**11**	**11**	**6**	**11**

1.6.9. Tendrovsko–Yagorlytskie Wetlands

1.6.9.1. Yagorlytskii Bay

Over the period of IWC counts in the region, this site was counted 4 times (Table 21), during which 30 waterbird species were observed (WI IWC database; Руденко, Яремченко, 2001; Руденко, Яремченко, Москаленко, 2002; Петрович, 2004a). The average number of birds per count was – 9,762 (R= 1,876 – 20,552). The average number of species was – 15.3 (R= 7 – 25). The most numerous species were *Anser albifrons* (A= 2,625; R= 0 – 10,000), *Anas platyrhynchos* (A= 1,662; R= 50 – 4,266), Aythya *ferina* (A= 810; R= 0 – 2,000), *Anas penelope* (A= 666; R= 0 – 1,661), *Aythya fuligula (*A= 599; R= 0 – 1,800), *Anas acuta* (A= 545; R= 0 – 2,000).

Table 21. The number of waterbird species observed at Yagorlytskii Bay

N	Species	1995	2000	2001	2003
1.	Tachybaptus ruficollis		60	32	
2.	Podiceps cristatus			6	
3.	Egretta alba			2	
4.	Anser anser		100	1000	
5.	Anser albifrons		10000	500	
6.	Anser fabalis			280	
7.	Cygnus olor	1000			400
8.	Cygnus cygnus	80			300
9.	Cygnus spp.		1600	2786	
10.	Tadorna ferruginea	4			
11.	Tadorna tadorna		27	194	13
12.	Anas platyrhynchos	50	4266	2080	250

13.	Anas crecca		180	190	
14.	Anas penelope		1003	1661	
15.	Anas acuta		2000	179	
16.	Anas querquedula		23		
17.	Anas clypeata		4	150	
18.	Aythya ferina	2000	380	860	
19.	Aythya nyroca		1	4	
20.	Aythya fuligula	1800	246	350	
21.	Aythya marila		320	100	
22.	Bucephala clangula		11	12	500
23.	Somateria mollissima				210
24.	Mergus serrator			10	
25.	Mergus merganser		2	4	
26.	Haliaeetus albicilla		13	7	3
27.	Numenius arquata		8	8	
28.	Larus minutus		30		
29.	Larus ridibundus	650	70	86	
30.	Larus cachinnans		186	428	200
31.	Larus canus		22	107	
	Total number of birds	**5584**	**20552**	**11036**	**1876**
	Total number of species	**7**	**22**	**24**	**8**

1.6.9.2 Tendrovskii Bay

Over the period of IWC counts in the region, this site was counted 5 times (Table 22), during which 31 waterbird species were observed (WI IWC database; Руденко, Яремченко, 2001; Руденко, Яремченко, Москаленко, 2002). The average number of birds per count was – 26,719 (R= 6,615 – 57,749). The average number of species was – 14.4 (R= 5 – 24). The most numerous species were *Aythya ferina* (A= 9,545; R= 0 – 39,150), *Anser albifrons* (A= 5,260; R= 0 – 20,000), *Cygnus olor* (A= 3,840; R= 0 – 10,000), *Aythya fuligula* (A= 2,670; R= 250 – 10,000), *Anas platyrhynchos* (A= 2,526; R= 15 – 5,310).

Table 22. The number of waterbird species observed at Tendrovskii Bay

N	Species	1991	1993	1995	2000	2001
1.	Podiceps cristatus				7	
2.	Phalacrocorax carbo				27	24
3.	Botaurus stellaris				1	
4.	Egretta alba				12	2
5.	Ardea cinerea	1			8	5
6.	Branta ruficollis				150	80
7.	Anser anser				400	400
8.	Anser albifrons	300			20000	6000
9.	Cygnus olor	10000	8100	1100		
10.	Cygnus cygnus			100		

11.	Cygnus spp.				4060	2027
12.	Tadorna tadorna	140	15		131	60
13.	Anas platyrhynchos	3500	200	15	5310	3607
14.	Anas crecca				1075	120
15.	Anas strepera				15	600
16.	Anas penelope				5	140
17.	Anas querquedula				300	
18.	Aythya ferina	4175	39150	3400		1000
19.	Aythya fuligula	600	10000	2000	250	500
20.	Aythya marila					150
21.	Bucephala clangula	33				24
22.	Somateria mollissima				124	110
23.	Mergellus albellus				12	20
24.	Mergus serrator	150			150	
25.	Mergus merganser				15	
26.	Haliaeetus albicilla	2	4		12	8
27.	Fulica atra				1000	100
28.	Pluvialis squatarola	250				
29.	Calidris spp.	200				
30.	Numenius arquata					58
31.	Numenius phaeopus					1
32.	Larus ridibundus		280		35	43
33.	Larus cachinnans	1500			200	112
34.	Larus canus				88	45
	Total number of birds	**20861**	**57749**	**6615**	**33387**	**15236**
	Total number of species	**13**	**7**	**5**	**24**	**24**

1.6.10. Dzharylgachskii Bay

Over the period of IWC counts in the region, this site was counted 11 times (Table 23), during which 41 waterbird species were observed (Ардамацкая, 1997, 1999, 2001; Руденко, Яремченко, 2001; Гавриленко, Руденко, Лопушанский, 2009; Руденко, Зацарный, 2011; Руденко, Зацарный, Москаленко, 2011; Руденко, Москаленко, 2011; Руденко, Москаленко, Зацарный, 2011; Руденко, Москаленко, Яремченко, 2011). The average number of birds per count was – 10,134 (R= 166 – 28,767). The average number of species was – 15.7 (R= 3 – 34). The most numerous species were *Anas platyrhynchos* (A= 3,490; R= 25 – 17,500), *Fulica atra* (A= 1,888; R= 0 – 8,599), *Anser albifrons* (A= 1,807; R= 0 – 5,840), *Cygnus olor* (A= 789; R= 0 – 2,434), *Aythya ferina* (A= 447; R= 0 – 2,800).

Table 23. The number of waterbird species observed at Dzharylgachskii Bay

N	Species	1997	1999	2000	2000	2001	2005	2006	2007	2008	2009	2010
1.	Gavia arctica		4	4								
2.	Tachybaptus ruficollis		6	4				3				
3.	Podiceps grisegena		4	2								
4.	Podiceps cristatus		8	3						3		

5.	Phalacrocorax carbo		36	15								
6.	Botaurus stellaris		2	2								
7.	Egretta alba		6	3							1	
8.	Egretta/Bubulcus spp.							1				
9.	Ardea cinerea		1					2				
10.	Branta ruficollis	160	16	75						1	3	
11.	Anser anser	640	245	1570								
12.	Anser albifrons	5840	594	3210		2500	1000	2700	200	2336	1500	
13.	Anser fabalis	1	3									
14.	Anser caerulescens		5									
15.	Cygnus olor	1100	934	1342				2434	1270	93	1460	43
16.	Cygnus cygnus	65	95	193				400	450	180	192	
17.	Cygnus spp.				1425	1230	813					52
18.	Tadorna tadorna		42	17	30						3	
19.	Anas platyrhynchos	17500	3126	3700	1840	1458	2790	4721	1570	322	1339	25
20.	Anas crecca	6	36	15								
21.	Anas penelope		40	24		10			12		3	
22.	Anas acuta		28	19								
23.	Anas querquedula		15									
24.	Anas clypeata				1							
25.	Anatinae spp.								100			
26.	Aythya ferina	2800	790	1280		50						
27.	Aythya fuligula	315	63		300		10	160		2		
28.	Aythya marila			340	110							
29.	Aythya spp.							5000	25			
30.	Bucephala clangula	56	45	25			8	12				
31.	Somateria mollissima			3								
32.	Mergellus albellus	30			5							
33.	Mergus serrator		50	64	540	130	45					
34.	Mergus merganser		23	16				1770				
35.	Haliaeetus albicilla	3		8	3	1		11	6	17	1	4
36.	Gallinula chloropus		2									
37.	Fulica atra	200	54	80	4060	3000		8599	4765		5	
38.	Numenius arquata	3	4	2	1						6	
39.	Charadrii spp.								15			
40.	Larus minutus		5	7	20	4					15	
41.	Larus ridibundus	21	56	42	17	12	2	2	19	5		
42.	Larus genei				10	2					2	
43.	Larus fuscus		1	3								
44.	Larus argentatus	17							16		40	
45.	Larus cachinnans		125	69	110	21	12	14	63	61	8	
46.	Larus canus	10	14	9	30	10	20	8	264	40	30	

47.	Larus spp.									10		42
	Total number of birds	**28767**	**6478**	**12146**	**8502**	**8428**	**4700**	**25837**	**8775**	**3070**	**4608**	**166**
	Total number of species	**18**	**34**	**31**	**15**	**12**	**8**	**14**	**11**	**11**	**16**	**3**

1.6.11. Southern coast of Crimea

1.6.11.1. Sevastopol Bays

Over the period of IWC counts in the region, this site was counted 3 times (Table 24), during which 35 waterbird species were observed (Мордвинов, 2001; Бескаравайный, 2011в, 2011г). The average number of birds per count was – 18,472 (R= 4,096 – 32,085). The average number of species was – 19.7 (R= 4 – 35). The most numerous species were *Fulica atra* (A= 10,300; R= 2,386 – 18,396), *Phalacrocorax carbo* (A= 1,139; R= 0 – 2,951), *Cygnus olor* (A= 734; R= 16 – 1,876), *Larus canus* (A= 727; R= 0 – 2,019), *Larus ridibundus* (A= 624; R= 0 – 1,271).

Table 24. The number of waterbird species observed in the Sevastopol Bays

N	Species	2000	2005	2008
1.	Gavia arctica		17	10
2.	Tachybaptus ruficollis		28	42
3.	Podiceps nigricollis		3	13
4.	Podiceps cristatus		25	236
5.	Phalacrocorax carbo		465	2951
6.	Phalacrocorax aristoteles		17	26
7.	Egretta alba			1
8.	Ardea cinerea		8	23
9.	Anser albifrons			1
10.	Cygnus olor	1876	16	311
11.	Cygnus cygnus			12
12.	Anas platyrhynchos		64	1387
13.	Anas crecca			1
14.	Anas penelope		2	52
15.	Anas acuta			3
16.	Anas clypeata			1
17.	Netta rufina			39
18.	Aythya ferina	1253	47	273
19.	Aythya nyroca			1
20.	Aythya fuligula	1253	152	254
21.	Bucephala clangula			5
22.	Somateria mollissima			1
23.	Oxyura leucocephala			1
24.	Mergellus albellus			12
25.	Mergus serrator			1

26.	Gallinula chloropus		1	21
27.	Fulica atra	18396	2386	9309
28.	Vanellus vanellus			2
29.	Tringa totanus		1	2
30.	Calidris alpina			6
31.	Larus melanocephalus		21	22
32.	Larus ridibundus		600	1271
33.	Larus cachinnans		81	924
34.	Larus canus		161	2019
35.	Larus spp.	9307		
36.	Sterna sandvicensis		1	3
	Total number of birds	**32085**	**4096**	**19236**
	Total number of species	**4**	**20**	**35**

1.6.12. Eastern Sivash

1.6.12.1. Southern part of Eastern Sivash

Over the period of IWC counts in the region, this site was counted 4 times (Table 25), during which 40 waterbird species were observed (Azov-Black Sea Ornithological Station database; Андрющенко, Попенко, 2009б; Андрющенко, Кинда, Попенко и др., 2011б). The average number of birds per count was – 86,417 (R= 13,435 – 292,922). The average number of species was – 22.8 (R= 13 – 39). The most numerous species were *Fulica atra* (A= 19,082; R= 504 – 69,480), *Anas platyrhynchos* (A= 5,704; R= 650 – 16,451), *Mergellus albellus* (A= 5,632; R= 0 – 22,528), *Anser albifrons* (A= 5,630; R= 2,508 – 8,500), *Anas penelope* (A= 5,219; R= 0 – 20870).

Table 25. The number of waterbird species observed in the Southern part of Eastern Sivash

N	Species	2002	2003	2005	2006
1.	Gavia arctica			1	
2.	Tachybaptus ruficollis			3	17
3.	Podiceps cristatus			49	
4.	Phalacrocorax carbo			56	3
5.	Phalacrocorax pygmaeus	38		917	186
6.	Botaurus stellaris	1		1	5
7.	Egretta alba	9	19	183	36
8.	Ardea cinerea	3	6	51	25
9.	Branta ruficollis	2	10		672
10.	Anser anser	20		344	42
11.	Anser albifrons	6879	8500	2508	4634
12.	Anser spp.				125
13.	Cygnus olor	1429	2	3488	1723
14.	Cygnus cygnus			171	103

15.	Cygnus spp.				4
16.	Tadorna ferruginea	10			
17.	Tadorna tadorna			698	152
18.	Anas platyrhynchos	4051	650	16451	1662
19.	Anas crecca			415	5
20.	Anas penelope			20870	4
21.	Anas acuta			606	40
22.	Anas clypeata			16	
23.	Anatinae spp.		2300	10660	4738
24.	Netta rufina			6134	
25.	Aythya ferina	26	250	137	3081
26.	Aythya nyroca			7	
27.	Aythya fuligula			600	21
28.	Aythya spp.			127000	
29.	Bucephala clangula			6068	
30.	Mergellus albellus		1	22528	
31.	Mergus serrator			637	
32.	Haliaeetus albicilla	43	11	50	60
33.	Rallus aquaticus			10	1
34.	Gallinula chloropus		1		1
35.	Fulica atra	504	570	69480	5774
36.	Pluvialis squatarola			150	
37.	Calidris alpina			400	
38.	Gallinago gallinago			2	
39.	Scolopax rusticola			1	
40.	Numenius arquata			31	
41.	Numenius spp.			16	
42.	Larus ichthyaetus			1	
43.	Larus minutus			11	
44.	Larus ridibundus			471	3
45.	Larus cachinnans		15	857	200
46.	Larus canus	1668	1100	843	1309
	Total number of birds	**14683**	**13435**	**292922**	**24626**
	Total number of species	**14**	**13**	**39**	**25**

1.6.12.2. Northern part of Eastern Sivash

Over the period of IWC counts in the region, this site was counted 9 times (Table 26), during which 44 waterbird species were observed (Андрющенко, Горлов, Дядичева и др., 1998; Андрющенко, Попенко, Черничко и др., 2003; Горлов, Кинда, Черничко, 2004; Черничко, Дядичева, Кинда, 2009а; Андрющенко, Кинда, Попенко и др., 2011а; Андрющенко, Попенко, 2011а, 2011б; Андрющенко, Попенко, Хоменко, 2011а). The average number of birds per count was – 68,929 (R= 2,813 – 246,707). The average number of species was – 22.7 (R= 12 – 33). The most numerous species were *Anas platyrhynchos* (A= 14,533; R= 124 – 45,312), Anser *albifrons* (A= 13,019; R= 707 – 52,071), *Tadorna tadorna* (A= 3,799; R= 0 – 14,516), *Aythya fuligula* (A= 3,172; R= 0 – 13,891), *Branta ruficollis* (A= 2,423; R= 0 –15,800), *Cygnus olor* (A= 2,398; R= 14 – 6,864),

Table 26. The number of waterbird species observed in the Northern part of Eastern Sivash

N	Species	1998	2001	2003	2005	2006	2007	2008	2009	2010
1.	Tachybaptus ruficollis		6			2				1
2.	Podiceps nigricollis				6					
3.	Podiceps auritus			1						
4.	Podiceps cristatus						2	1		
5.	Puffinus puffinus				1					
6.	Phalacrocorax carbo		2	1		1	37			
7.	Phalacrocorax pygmaeus		305	222	155	1027	28	56	30	8
8.	Botaurus stellaris			2		1		1	1	
9.	Egretta alba		316	1	14	138	11			1
10.	Ardea cinerea		4	2		45	15			
11.	Branta ruficollis	500	15800		28	5	5279	165	30	
12.	Anser anser	1	87		49		260			
13.	Anser albifrons	23377	52071	14780	4133	756	18579	1904	707	863
14.	Anser spp.						1500	900		
15.	Cygnus olor	2370	1192	205	4406	6864	5400	14	157	975
16.	Cygnus cygnus		67		22	89	42	16		112
17.	Cygnus spp.		16484							
18.	Tadorna ferruginea						25			
19.	Tadorna tadorna		10066		9488	88	14516	1	3	26
20.	Anas platyrhynchos	11733	15198	1305	45312	13779	38080	124	1333	3936
21.	Anas crecca		464		17	104	25	13		350
22.	Anas penelope		4663		1601	1	4177			600
23.	Anas acuta		187		267	49	345	5		106
24.	Anas clypeata		128		252					
25.	Anatinae spp.				300					
26.	Netta rufina		53						1	48
27.	Aythya ferina		291		40	403	533	3	60	43
28.	Aythya fuligula	1130			13520	9	13891			
29.	Aythya marila	294								
30.	Aythya spp.				23100		9080			
31.	Bucephala clangula	1142	1		3940	291	3024	4		
32.	Anatinae spp.		127825			150	32262		23	
33.	Mergellus albellus		1	52	2		3586			
34.	Mergus serrator			1	138	3	155			
35.	Mergus merganser				1		2			
36.	Haliaeetus albicilla	13	76	6	9	69	20	5	7	6
37.	Rallus aquaticus		6	3	2	5				
38.	Gallinula chloropus		17	1	1	9	1		3	
39.	Fulica atra		507	68	15	1058	2823	2	41	1707

40.	Philomachus pugnax		3							
41.	Calidris alpina		70		110			1		
42.	Calidris spp.				6				150	
43.	Lymnocryptes minimus					1				
44.	Gallinago gallinago		2			1		1		
45.	Numenius arquata		24		51	3	67			
46.	Numenius phaeopus				2		1			
47.	Numenius spp.				35					
48.	Larus ichthyaetus				18		9			
49.	Larus ridibundus	24	23		732		3			186
50.	Larus genei						62			
51.	Larus cachinnans	963	107	175	278	36	1671	3	81	7
52.	Larus canus	475	661	885	1686	2399	5154	29	166	937
53.	Larus spp.					160			20	
	Total number of birds	**42022**	**246707**	**17710**	**109737**	**27546**	**160665**	**3248**	**2813**	**9912**
	Total number of species	**12**	**31**	**17**	**33**	**28**	**32**	**19**	**14**	**18**

1.6.13. Central Sivash

1.6.13.1. Southern part of Central Sivash

Over the period of IWC counts in the region, this site was counted 3 times (Table 27), during which 26 waterbird species were observed (Андрющенко, Попенко, Черничко и др., 2003; Черничко, Дядичева, Кинда, 2009б; Андрющенко, Попенко, 2011е). The average number of birds per count was – 27,451 (R= 7,147 – 55,228). The average number of species was – 17.0 (R= 12 – 22). The most numerous species were *Tadorna tadorna* (A= 8,102; R= 2,841 – 18,210), *Anas platyrhynchos* (A= 7,011; R= 1,085 – 18,625), *Anser albifrons* (A= 4,512; R= 0 – 13,122), *Branta ruficollis* (A= 4,462; R= 0 – 12,116).

Table 27. The number of waterbird species observed in the Southern part of Central Sivash

N	Species	2001	2005	2006
1.	Podiceps cristatus		1	
2.	Phalacrocorax carbo		19	
3.	Botaurus stellaris			2
4.	Egretta alba	2	42	
5.	Ardea cinerea	1	17	1
6.	Branta ruficollis	1270	12116	
7.	Anser anser		145	
8.	Anser albifrons	413	13122	
9.	Cygnus olor	2	157	25
10.	Cygnus cygnus		13	
11.	Cygnus spp.		20	
12.	Tadorna ferruginea	81	92	

13.	Tadorna tadorna	3255	2841	18210
14.	Anas platyrhynchos	1324	18625	1085
15.	Anas crecca	380	87	5
16.	Anas penelope		9	
17.	Anas spp.		6100	
18.	Aythya ferina			130
19.	Aythya fuligula	11		
20.	Bucephala clangula		8	
21.	Mergus serrator		140	1
22.	Haliaeetus albicilla	6	25	5
23.	Grus grus	13	2	
24.	Rallus aquaticus	1	3	3
25.	Vanellus leucurus	1		
26.	Gallinago gallinago	4		
27.	Larus ichthyaetus		2	
28.	Larus cachinnans	3	180	329
29.	Larus canus	380	1462	181
	Total number of birds	**7147**	**55228**	**19977**
	Total number of species	**17**	**22**	**12**

1.6.13.2. Northern part of Central Sivash

Over the period of IWC counts in the region, this site was counted 8 times (Table 28), during which 33 waterbird species were observed (Azov-Black Sea Ornithological Station database; Андрющенко, Горлов, Дядичева и др., 1998; Андрющенко, Попенко, 2009а, 2011д, 2011ж, 2011з; Андрющенко, Кинда, Попенко и др., 2011в; Андрющенко, Попенко, Хоменко, 2011б). The average number of birds per count was – 34,138 (R= 2,876 – 107,717). The average number of species was – 13.9 (R= 8 – 20). The most numerous species were *Anser albifrons* (A= 14,045; R= 97 – 61,665), *Anas platyrhynchos* (A= 11,441; R= 500 – 38,085), *Tadorna tadorna* (A= 2,238; R= 0 – 8,200), *Branta ruficollis* (A= 2,614; R= 0 – 14,783), *Larus canus* (A= 1,691; R= 63 – 6,142).

Table 28. The number of waterbird species observed in the Northern part of Central Sivash

N	Species	1998	2003	2005	2006	2007	2008	2009	2010
1.	Phalacrocorax carbo					28			2
2.	Botaurus stellaris						2	1	
3.	Egretta alba		7	36		5			3
4.	Ardea cinerea	1	2	17	1	16	2	4	
5.	Branta ruficollis	1591	1250			14783		120	3170
6.	Anser anser	288				257			3
7.	Anser albifrons	61665	900	4800	97	26704	1256	1042	15894
8.	Anser erythropus	300							
9.	Anser fabalis					40			
10.	Anser spp.					12			
11.	Cygnus olor	18		79	35		76	34	254

12.	Cygnus cygnus	2		7		4	8	8	
13.	Cygnus columbianus					244			
14.	Cygnus spp.			6			13		
15.	Tadorna ferruginea	19				107	57	142	5
16.	Tadorna tadorna	24	8200		3519	3832	380	433	1514
17.	Anas platyrhynchos	38085	500	4524	1571	13093	972	1868	30912
18.	Anas crecca				6	259	20		
19.	Anas strepera				2				
20.	Anas penelope					803			450
21.	Anas clypeata				1				
22.	Anatinae spp.					1100		25	
23.	Aythya ferina				135	8506	1		350
24.	Aythya marila				40				
25.	Bucephala clangula						2		
26.	Mergellus albellus						7		
27.	Haliaeetus albicilla	12	1	7	3	9	8	13	20
28.	Gallinula chloropus						1		
29.	Fulica atra				17	73			1
30.	Tringa ochropus					2			
31.	Calidris alpina							70	
32.	Numenius arquata			1					
33.	Larus ichthyaetus								12
34.	Larus genei				2				
35.	Larus cachinnans	849		522	4	457	8	104	423
36.	Larus canus	4863	190	352	416	1226	63	278	6142
37.	Larus spp.					400			
	Total number of birds	**107717**	**11050**	**10351**	**5849**	**71960**	**2876**	**4142**	**59155**
	Total number of species	**13**	**8**	**10**	**15**	**20**	**16**	**13**	**16**

1.6.14. Western Sivash

Over the period of IWC counts in the region, this site was counted 7 times (Table 29), during which 39 waterbird species were observed (WI IWC database; Azov-Black Sea Ornithological Station database; Андрющенко, Горлов, Кинда и др., 2001; Гавриленко, Думенко, Лопушанский, 2002; Гавриленко, Лопушанский, Мезинов, 2009а; Андрющенко, Попенко, 2011г). The average number of birds per count was – 43,639 (R= 1,934 – 201,552). The average number of species was – 14.3 (R= 9 – 24). The most numerous species were *Anas platyrhynchos* (A= 25,545; R= 918 – 127,500), *Anser albifrons* (A= 14,491; R= 434 – 72,700), *Tadorna tadorna* (A= 542; R= 0 – 2,000), *Cygnus olor* (A= 388; R= 0 – 1,500), *Larus canus* (A= 368; R= 29 – 1,387).

Table 29. The number of waterbird species observed in Western Sivash

N	Species	1991	2000	2001	2003	2004	2005	2006
1.	Tachybaptus ruficollis							1
2.	Podiceps nigricollis	10						

3.	Podiceps cristatus			3				
4.	Phalacrocorax carbo			16				
5.	Botaurus stellaris	3		1				
6.	Egretta alba	67		6		8	10	
7.	Egretta garzetta	1		183		7		1
8.	Egretta spp.							1
9.	Ardea cinerea	40		12	1		1	3
10.	Ardea purpurea			2				
11.	Branta ruficollis					5	40	
12.	Anser anser	200	2	64	315			
13.	Anser albifrons	20000	541	72700	1261	434	500	6000
14.	Anser spp.				88			
15.	Cygnus olor	1500	211	398		141	75	388
16.	Cygnus cygnus	200				3		
17.	Tadorna ferruginea					9	26	200
18.	Tadorna tadorna	2000	1172	491	101	12		20
19.	Anas platyrhynchos	10000	1721	127500	4029	918	1642	33005
20.	Anas crecca					22	70	
21.	Anas penelope	15	23					
22.	Anas acuta	15					15	
23.	Anas querquedula			154				
24.	Anas clypeata	2						
25.	Aythya ferina	500						
26.	Aythya fuligula						6	
27.	Aythya marila		18					
28.	Mergus serrator	10						
29.	Mergus merganser			1				
30.	Haliaeetus albicilla	3		5	9	1	1	
31.	Grus grus			14	8			
32.	Rallus aquaticus					3		
33.	Gallinula chloropus						1	
34.	Fulica atra	1160		2		9		7
35.	Vanellus vanellus	3						
36.	Numenius arquata						3	
37.	Limosa limosa	2						
38.	Larus ichthyaetus					1		
39.	Larus ridibundus	320	2					
40.	Larus fuscus	13						
41.	Larus cachinnans	605	494		314	291	462	
42.	Larus canus	1387	423		29	70	665	
43.	Larus spp.				19			10010
	Total number of birds	**38056**	**4607**	**201552**	**6174**	**1934**	**3517**	**49636**
	Total number of species	**24**	**10**	**17**	**9**	**16**	**15**	**9**

1.6.15. Utlyukskie Wetlands

1.6.15.1. Utlukskii and Sivashik Limans

Over the period of IWC counts in the region, this site was counted 8 times (Table 30), during which 31 waterbird species were observed (WI IWC database; Андрющенко, Горлов, Дядичева и др., 1998; Андрющенко, Горлов, Кинда и др., 2001; Кошелев, Кошелев, Пересадько, 2002; Попенко, 2004б, 2004в; Черничко, Горлов, 2009б; Черничко, Черничко, Дядичева и др., 2011; Черничко, Черничко, Дядичева и др., 2011). The average number of birds per count was – 23,743 (R= 91 – 49,561). The average number of species was – 12.8 (R= 3 – 20). The most numerous species were *Anser albifrons* (A= 7,622; R= 4 – 33,243), *Anas platyrhynchos* (A= 7,405; R= 0 – 21,069), *Fulica atra* (A= 2,734; R= 0 – 15,091), *Cygnus olor* (A= 1,973; R= 0 – 8,200), *Larus canus* (A= 1,420; R= 3 – 7,580).

Table 30. The number of waterbird species observed at Utlukskii and Sivashik Limans

N	Species	1991	1998	2000	2001	2003	2006	2007	2008
1.	Podiceps cristatus	1	116						
2.	Phalacrocorax carbo	1			20				
3.	Botaurus stellaris		1		0				
4.	Egretta alba	5		5	0			31	
5.	Ardea cinerea				0		1	3	
6.	Branta ruficollis	12	203		100			120	
7.	Anser anser	2850	550	417	60				
8.	Anser albifrons	6070	33243	6137	14943	4	210	255	115
9.	Cygnus olor	8200	2898	2525	261		30	1868	
10.	Cygnus cygnus			9	59			19	
11.	Tadorna ferruginea	3							
12.	Tadorna tadorna				865			320	
13.	Anas platyrhynchos	15712	8545	7947	5921	37	6	21069	
14.	Anas crecca				14				
15.	Anas penelope							10	
16.	Anas acuta				1			9	
17.	Netta rufina						300	2170	
18.	Aythya ferina		508	60	1260		3000	250	
19.	Aythya fuligula		220	820					
20.	Aythya marila	250	400		1080				
21.	Bucephala clangula		130	20	210			713	
22.	Mergellus albellus		5						1
23.	Mergus serrator		2						
24.	Haliaeetus albicilla	5	5	8	4		15	21	6
25.	Grus grus			1					
26.	Fulica atra	4750	500	690			840	15091	
27.	Vanellus vanellus			2					
28.	Numenius arquata							19	
29.	Larus ichthyaetus				12			1	
30.	Larus ridibundus	1500	420		66			8	

31.	Larus cachinnans	736	343	220	114			4	
32.	Larus canus	728	840	1670	442	50	3	7580	48
	Total number of birds	**40823**	**48929**	**20531**	**25432**	**91**	**4405**	**49561**	**170**
	Total number of species	**15**	**18**	**15**	**18**	**3**	**9**	**20**	**4**

1.6.16. Molochanskie Wetlands

1.6.16.1. Molochnyi Liman

Over the period of IWC counts in the region, this site was counted 16 times (Table 31), during which 41 waterbird species were observed (WI IWC database; Azov-Black Sea Ornithological Station database; Андрющенко, Горлов, Дядичева и др., 1998; Андрющенко, Горлов, Кинда и др., 2001; Кошелев, Кошелев, Пересадько, 2002; Попенко, 2004а; Черничко, Горлов, 2009; Черничко, Дядичева, Кинда, Черничко, 2011а, 2011б; Черничко, Дядичева, Кинда, Кошелев и др., 2011; Черничко, Дядичева, Кинда, Сучков и др., 2011; Черничко, Черничко, Кошелев, 2011). The average number of birds per count was – 16,544 (R= 12 – 60,414). The average number of species was – 11.4 (R= 2 – 29). The most numerous species were *Larus canus* (A= 4,234; R= 0 – 25,843), *Anas platyrhynchos* (A= 4,156; R= 4 –14,134), *Aythya marila* (A= 3,231; R= 0 – 23,300), *Anser albifrons* (A= 2,212; R= 0 – 6,544), *Bucephala clangula* (A= 949; R= 0 – 7,080).

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Table 31. The number of waterbird species observed at Molochnyi Liman

N	Species	1991	1997	1998	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1.	Tachybaptus ruficollis								3					6			
2.	Podiceps cristatus	1												4	1		
3.	Phalacrocorax carbo										7			21			
4.	Botaurus stellaris	3					10	2						1			
5.	Egretta alba							2			20			86			
6.	Ardea cinerea							3						29			
7.	Branta ruficollis										124	6		17			
8.	Anser anser	680			2004		808	37			94	139		2	60		33
9.	Anser albifrons	5500			6544		6018	4620			2561	1887	5500	2696	1		77
10.	Anser spp.																80
11.	Cygnus olor	1502	3	160	65	215	2841	534	2		131	12	3	10			
12.	Cygnus cygnus		1						2					16			
13.	Tadorna ferruginea										3						
14.	Tadorna tadorna						2	3			799			88			
15.	Anas platyrhynchos	5397	281	4	9859	60	7306	6574	3089	4	12005	3350	1908	14134	970	98	1458
16.	Anas crecca										81	720					
17.	Anas penelope										7	330					
18.	Anas acuta						1	2			136	9					
19.	Aythya ferina	10					850	850			30			3			
20.	Aythya nyroca										2						
21.	Aythya fuligula						1707	880			3	6		7			
22.	Aythya marila	6000						4110			5630	23300		12660			
23.	Bucephala clangula	4890	6				30	102			1160	7080		1913	3		
24.	Mergellus albellus										14	15		230	1		
25.	Mergus serrator										7	78			2		

26.	Mergus merganser													6	2		3
27.	Haliaeetus albicilla	2	1		4		13	7	1		6	6	2	7	15	24	6
28.	Rallus aquaticus						12				3			3			
29.	Gallinula chloropus						3										
30.	Pluvialis squatarola													4			
31.	Vanellus vanellus										1						
32.	Tringa ochropus										1						
33.	Tringa spp.										1						
34.	Calidris alpina										75			370			
35.	Scolopax rusticola													1			
36.	Numenius arquata							2			124	3		25			
37.	Charadrii spp.																8
38.	Larus ichthyaetus										1						
39.	Larus minutus											1		10			
40.	Larus ridibundus	13		50	39	350		44				1		75			
41.	Larus genei	14															
42.	Larus fuscus					1		1									
43.	Larus cachinnans	1159	461		1253		1733	3842			322	706	327	353		2	13
44.	Larus canus		24	200	22	400	13	2016	160	8	11580	22765	3485	25843	79	638	503
	Total number of birds	**25171**	**777**	**414**	**19790**	**1026**	**21347**	**23631**	**3257**	**12**	**34928**	**60414**	**11225**	**58620**	**1134**	**762**	**2195**
	Total number of species	**13**	**7**	**4**	**8**	**5**	**15**	**19**	**6**	**2**	**28**	**19**	**6**	**29**	**10**	**4**	**8**

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2. Georgia

Goradze I., Abuladze A., Mamuchadze J.

2.1. Coordination of counts and network of counters

The majority of past midwinter waterbird studies was conducted by the personnel of the Georgian Centre for Conservation of Wildlife (GCCW). Past studies were conducted under the framework of Environmental Impact Assessments in relation to the development of Supsa and Kulevi oil terminals and in relation to the establishment of Kolkheti National Park.

IWC in Georgia is coordinated by the Georgian Centre for Conservation of Wildlife. The network of counters is rather small and includes representatives from the Georgian Centre for Conservation of Wildlife (Tbilisi), Ilia State University (Tbilisi), Tbilisi ZOO, Tbilisi State University, the Institute of Zoology (Tbilisi) and, sometimes, representatives of foreign organizations (see detailed information in Annex1).

2.2. Methodological aspects of organizing and conducting censuses

The IWC count is Georgia has quite a short history during which the methodological framework. was created First of all a detailed monitoring protocol for wintering waterbirds was developed for Kolkheti National Park and Kobuleti National Reserve and training for their staff was conducted. Through participation of in counts the network of counters obtained practical experience in IWC. A unified territorial scheme (i.e., site delimitation) for accomplishing counts is basically established and is presented below in Table 32.

Table 32. List of monitoring sited

N	Name
1.	Black Sea Coast (Near Anaklia)
2.	Churia Marshes
3.	Black Sea Coast within Kolkheti National Park: Churia - Khobi
4.	Black Sea Coast within Kolkheti National Park: Khobi-Rioni
5.	Partotskali Lake
6.	Rioni River Delta
7.	Paliastomi Lake
8.	Black Sea Coast (off the Paliastomi channel)
9.	Peat Cuttings (South of Paliastomi)
10.	Khidmaghala Fishponds
11.	Ispani Marshes (Kobuleti National Reserve)
12.	Chorokhi River Delta

Nevertheless a final delimitation of the Black Sea coast sites is still needed. Due to this problem, much of the data from earlier counts was collected for overlapping areas of the coast. That makes it more difficult to use this material in analysis. Another problem is the timing of counting – this has varied from December until the end of February, and only some of the counts were conducted in mid January, as required by IWC methodology. Among the weaknesses of winter counts of waterbirds in Georgia it is also worth mentioning the limited number of counters, irregular counts, varying coverage of sites from year to year and absence of a computer data base.

2.3. The time period and coverage of sites

The first midwinter waterbird studies following IWC compatible methods date back to 1989 and mainly relate to the south part of Georgia – Ajaria. In 1997 – 1999 counts were conducted within

the framework of EIA for the Supsa Oil Terminal Project. In 2003, 2005, 2006 the waterbird studies were conducted under the Kolkheti National Park monitoring program (Georgia Integrated Coastal Management Project). The 2005 – 2006 waterbird study was performed in connection to the Kulevi Oil Terminal zoological monitoring program.

Based on the former IWC studies, the monitoring sites were established mainly where regular counts had been started. Sites include protected areas (including Ramsar sites) as well as areas without protected status but which are nationally recognized sites where regularly high concentrations of wintering waterbirds occur. Data for 1989, 1990 and 1991 cover only Ajaria coast and was submitted as a whole, but not site by site. Details on site coverage between 1995 – 2006 are presented in table 33.

Table 33. Site coverage for IWC in Georgia between 1995 - 2006

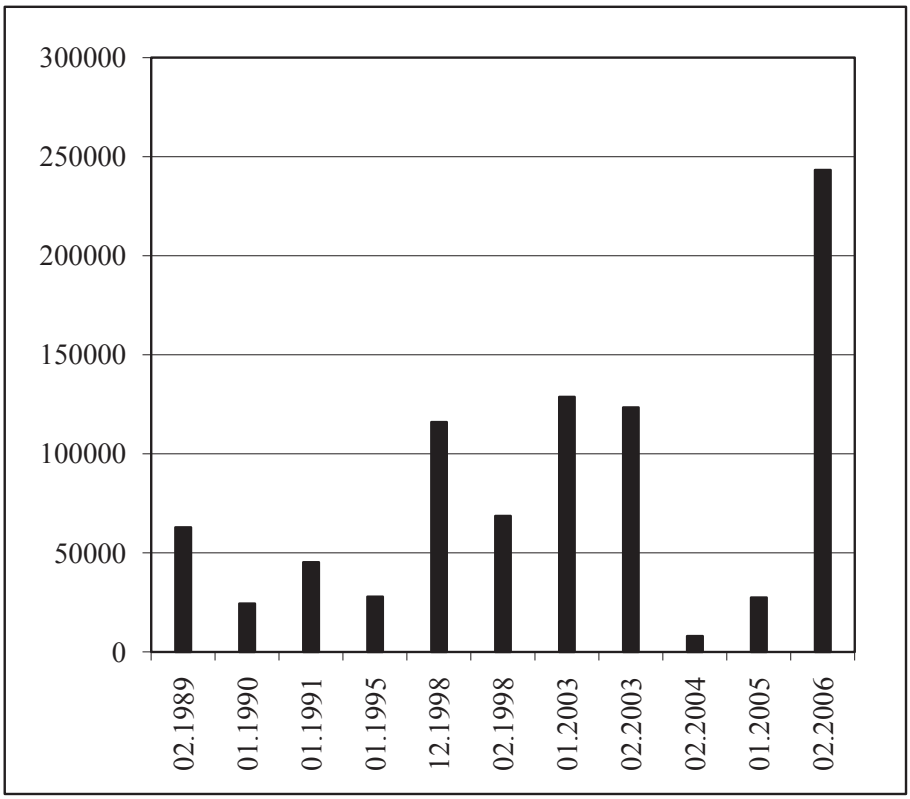
Site name	1995	1998	2003	2004	2005	2006
Churia Marshes			1		1	
Black Sea Coast within Kolkheti National Park: Churia - Khobi and Khobi - Rioni			1		1	1
Black Sea Coast outside Kolkheti National Park			1		1	1
Partotskali Lake			1			1
Rioni River Delta			1		1	1
Paliastomi Lake		1	1		1	1
Peat Cuttings (South of Paliastomi)		1	1		1	1
Khidmaghala Fishponds		1	1			1
Ispani Marshes (Kobuleti National Reserve)						1
Chorokhi River Delta	1		1			1
Black Sea Coast (Sarpi-Chorokhi)	1					
Black Sea Coast (Makhinjauri-Kobuleti)	1					
Black Sea Coast (Kobuleti - R.Choloki	1					
Black Sea Coast (Ureki – Poti)			1			
Black Sea Coast (Kobuleti – Ureki)			1			
Black Sea Coast (Batumi – Kobuleti)			1			

2.4. Species coverage and general count results

For the period 1989 – 2006 a total of 876,272 waterbirds of 68 species were have been counted along the Georgian coast, the number varying from 8,026 in 2004 to 243,322 in 2006 (Pic.7).

In 1989, 1990, 1991 and 1995 counts were conducted in Ajaria only. In December 1998 data was collected by helicopter and by land counts also in this region only (from both counts were selected the maximum per species). In February 1998 counts were conducted mainly in Kolkheti National Park and adjacent areas. Regardless of the fact that counts covered different areas, data was not summarized since the difference in time between counts was over two months. Data for 2003 also was not summed up since counts were conducted in different months – January and February, and, beside this, the areas of counting partly overlapped. For 2004 counts covered Ajaria's coast only, and in 2005 - Kolkheti National Park and adjacent areas. Data of 2006 is a combination of a series of counts on two parts of the coast: Ajaria - from the Turkish border to Batumi (102,212 birds) and from Kolkheti National Park to Kobuleti National Reserve (141,441 birds). Taking into account that all counts were conducted within quite a short period 5 – 24 February, the count results were combined.

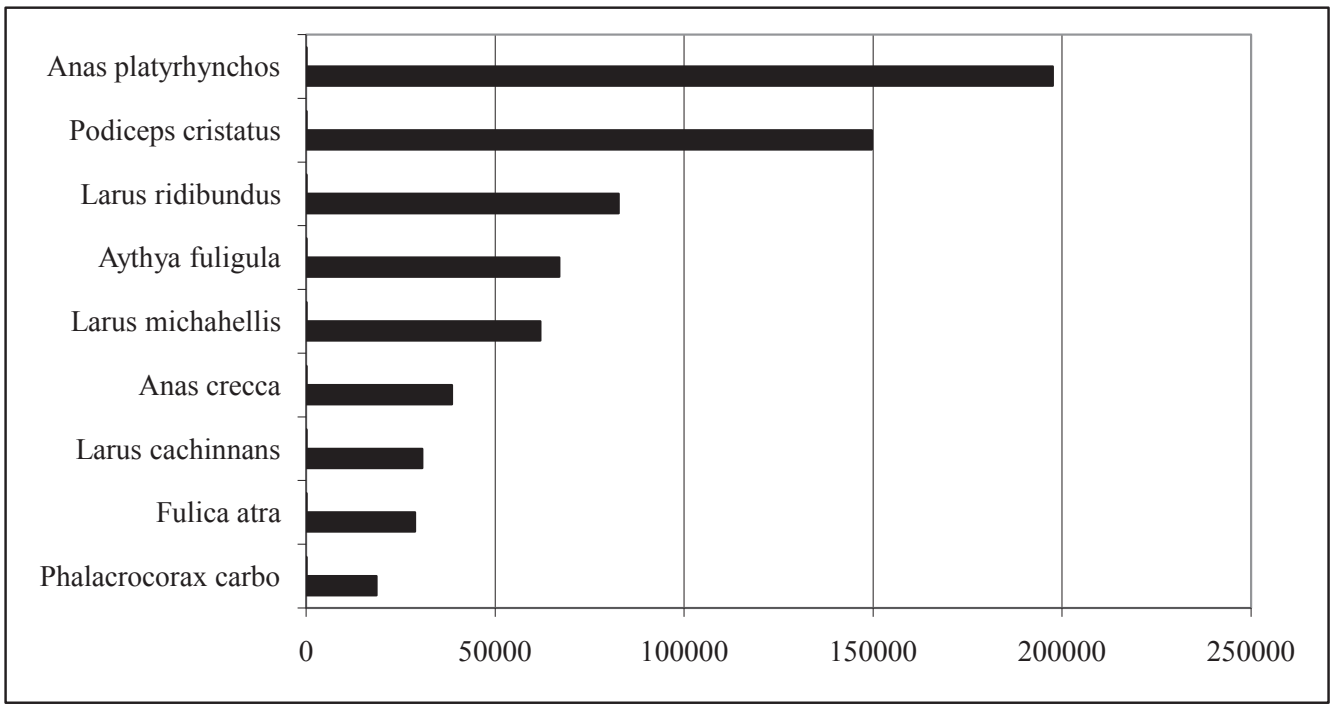
The most numerous species observed during IWC along the Black Sea coast of Georgia were *Anas platyrhynchos* (197,534 / 22.54%), *Podiceps cristatus* (149,675 / 17.08%), *Larus ridibundus* (82,703 / 9.44%), *Aythya fuligula* (66,992 / 7.65%), *Larus michahellis (*62,018 / 7.08%), *Anas crecca* (38,617/ 4.41%), *Larus cachinnans* (30,723 / 3.51%), *Fulica atra* (28,795 / 3.29%) and *Phalacrocorax carbo*



Pic. 7. Number of waterbirds during the IWC 1989 – 2006

(18,641 / 2.13%) (see Pic.8 and Table 34). Beside waterbirds, 17 individuals of the wetland–dependent raptor *Haliaeetus albicilla* were counted.

Comparison of the ratios of different taxonomic groups shows that the most numerous are Anseriformes - 350,977 birds / 40.05%, Charadriiformes - 302,209 / 34.49% and Podicipediformes – 173,457 / 19.79%. Other taxonomic groups were less abundant: Gruiformes – 28,796 / 3.29%, Pelecaniformes – 18,714 / 2.14%. The rest of groups - Ciconiiformes, Gaviiformes, Procellariiformes, Falconiformes – in total make up less than 1% of counted birds.



Pic. 8. The most common waterbird species observed at sites along the Georgian coast

Table 34. The total numbers of birds counted for the period 1989 – 2006

Order	Family	Species name	Total	%
Gaviiformes	Gaviidae	Gavia stellata	81	0.01
Gaviiformes	Gaviidae	Gavia arctica	337	0.04
Gaviiformes	Gaviidae	Gavia spp.	321	0.04
		Sub-total	***739***	***0.08***
Podicipediformes	Podicipedidae	Tachybaptus ruficollis	1433	0.16
Podicipediformes	Podicipedidae	Podiceps nigricollis	1869	0.21
Podicipediformes	Podicipedidae	Podiceps auritus	2	< 0.01
Podicipediformes	Podicipedidae	Podiceps grisegena	62	0.01
Podicipediformes	Podicipedidae	Podiceps cristatus	149675	17.08
Podicipediformes	Podicipedidae	P.nigricollis/cristatus	20060	2.29
Podicipediformes	Podicipedidae	Podiceps spp.	356	0.04
		Sub-total	***173457***	***19.79***
Procellariiformes	Procellariidae	Puffinus yelkouan	62	0.01
Procellariiformes	Procellariidae	Puffinus puffinus	11	< 0.01
		Sub-total	***73***	***0.01***
Pelecaniformes	Pelecanidae	Pelecanus onocrotalus	9	< 0.01
Pelecaniformes	Pelecanidae	Pelecanus crispus	27	< 0.01
Pelecaniformes	Pelecanidae	Pelecanus spp.	9	< 0.01
Pelecaniformes	Phalacrocoracidae	Phalacrocorax carbo	18641	2.13
Pelecaniformes	Phalacrocoracidae	Phalacrocorax aristotelis	28	< 0.01
		Sub-total	***18714***	***2.14***
Ciconiiformes	Ardeidae	Botaurus stellaris	16	< 0.01
Ciconiiformes	Ardeidae	Egretta alba	223	0.03
Ciconiiformes	Ardeidae	Egretta garzetta	373	0.04
Ciconiiformes	Ardeidae	Ardea cinerea	545	0.06
		Sub-total	***1157***	***0.13***
Anseriformes	Anatidae	Anser anser	383	0.04
Anseriformes	Anatidae	Anser albifrons	546	0.06
Anseriformes	Anatidae	Anser spp.	78	0.01
Anseriformes	Anatidae	Cygnus olor	367	0.04
Anseriformes	Anatidae	Cygnus cygnus	515	0.06
Anseriformes	Anatidae	Cygnus spp.	55	0.01
Anseriformes	Anatidae	Tadorna ferruginea	37	< 0.01
Anseriformes	Anatidae	Tadorna tadorna	104	0.01
Anseriformes	Anatidae	Anas platyrhynchos	197534	22.54
Anseriformes	Anatidae	Prob.>99% Anas platyrhynchos	5500	0.63
Anseriformes	Anatidae	Anas crecca	38617	4.41
Anseriformes	Anatidae	Anas strepera	683	0.08
Anseriformes	Anatidae	Anas penelope	635	0.07
Anseriformes	Anatidae	Anas acuta	828	0.09

Anseriformes	Anatidae	Anas querquedula	1709	0.20
Anseriformes	Anatidae	Anas clypeata	94	0.01
Anseriformes	Anatidae	Anas spp.	29345	3.35
Anseriformes	Anatidae	Netta rufina	386	0.04
Anseriformes	Anatidae	Aythya ferina	2054	0.23
Anseriformes	Anatidae	Aythya nyroca	59	0.01
Anseriformes	Anatidae	Aythya fuligula	66992	7.65
Anseriformes	Anatidae	Aythya marila	42	< 0.01
Anseriformes	Anatidae	Anas, Aythya – mixed	3520	0.40
Anseriformes	Anatidae	Bucephala clangula	313	0.04
Anseriformes	Anatidae	Melanitta fusca	3	< 0.01
Anseriformes	Anatidae	Oxyura leucocephala	4	< 0.01
Anseriformes	Anatidae	Mergellus albellus	480	0.05
Anseriformes	Anatidae	Mergus serrator	65	0.01
Anseriformes	Anatidae	Mergus merganser	29	< 0.01
		Sub-total	***350977***	***40.05***
Gruiformes	Rallidae	Gallinula chloropus	1	< 0.01
Gruiformes	Rallidae	Fulica atra	28795	3.29
		Sub-total	***28796***	***3.29***
Charadriiformes	Charadriidae	Pluvialis apricaria	39	< 0.01
Charadriiformes	Charadriidae	Vanellus vanellus	710	0.08
Charadriiformes	Charadriidae	Arenaria interpres	1	< 0.01
Charadriiformes	Charadriidae	Recurvirostra avosetta	6	< 0.01
Charadriiformes	Scolopacidae	Tringa ochropus	1	< 0.01
Charadriiformes	Scolopacidae	Tringa erythropus	1	< 0.01
Charadriiformes	Scolopacidae	Calidris alpina	11	< 0.01
Charadriiformes	Scolopacidae	Calidris alba	68	0.01
Charadriiformes	Scolopacidae	Lymnocryptes minimus	1	< 0.01
Charadriiformes	Scolopacidae	Gallinago gallinago	5	< 0.01
Charadriiformes	Scolopacidae	Numenius arquata	71	0.01
Charadriiformes	Stercorariidae	Stercorarius pomarinus	42	< 0.01
Charadriiformes	Stercorariidae	Stercorarius parasiticus	26	< 0.01
Charadriiformes	Stercorariidae	Stercorarius spp.	26	< 0.01
Charadriiformes	Laridae	Larus ichthyaetus	49	0.01
Charadriiformes	Laridae	Larus melanocephalus	37	< 0.01
Charadriiformes	Laridae	Larus minutus	7224	0.82
Charadriiformes	Laridae	Larus ridibundus	82703	9.44
Charadriiformes	Laridae	Prob.>99% Larus ridibundus	73900	8.43
Charadriiformes	Laridae	Larus genei	748	0.09
Charadriiformes	Laridae	Larus fuscus	12	< 0.01
Charadriiformes	Laridae	Larus argentatus	1	< 0.01
Charadriiformes	Laridae	Larus cachinnans	30723	3.51

Charadriiformes	Laridae	Larus michahellis	62018	7.08
Charadriiformes	Laridae	Larus michahellis/ cachinnans	6670	0.76
Charadriiformes	Laridae	Larus armenicus	116	0.01
Charadriiformes	Laridae	Larus michah/cachin/ armen.	17775	2.03
Charadriiformes	Laridae	Larus canus	1679	0.19
Charadriiformes	Laridae	Larus spp.	17477	1.99
Charadriiformes	Laridae	Sterna sandvicensis	59	0.01
Charadriiformes	Laridae	Sterna spp.	10	< 0.01
		Sub-total	***302209***	***34.49***
		Total	**876122**	**100.00**
Falconiformes	Accipitridae	Haliaeetus albicilla	17	
		Total	**876139**	

2.5. Waterbird count results for key coastal wetlands of Georgia

To present the results of wintering waterbird counts in relation to key coastal wetlands only part of the collected information was used. The reason of this is the same as for Ukraine - a large part of the submitted data is not linked to concrete wetlands (like - "Ajarian Coast") or refers to overlapping areas. Partly this information was included as an additional item of data (see.2.5.11).

Location of count sites is presented in Pic.6.

2.5.1. Churia Marshes

During two counts at Churia Marches 10 waterbird species were observed (Table 35). The maximum number of birds per count was 324. The average number of species was – 7 (R= 4 – 10). The most numerous species during the counts were *Vanellus vanellus* (A= 225; R= 150 – 300), *Fulica atra* (108).

Table 35. The number of waterbird species observed at Churia Marshes

N	Species	2003	2005
1.	Tachybaptus ruficollis	9	7
2.	Podiceps cristatus	14	8
3.	Pelecanus crispus	1	
4.	Phalacrocorax carbo	1	
5.	Ardea cinerea	4	
6.	Egretta alba	15	9
7.	Aythya ferina	9	
8.	Aythya fuligula	12	
9.	Fulica atra	108	
10.	Vanellus vanellus	150	300
	Total number of birds	**323**	**324**
	Total number of species	**10**	**4**

2.5.2. Black Sea Coast within Kolkheti National Park: Churia – Khobi – Rioni

During three counts 19 waterbird species were observed (Table 36). The average number of birds per count was 26,692 (R= 10,147 – 36,217). The average number of species was – 10.3 (R= 5 – 15). The most numerous species during the counts were *Anas platyrhynchos* (A= 13,034; R= 4,800 – 17,497), *Podiceps cristatus* (A= 3,613; R= 126 – 9,432), *Larus ridibundus* (A= 1,620; R= 1,360 – 2,000), *Phalacrocorax carbo* (A= 1,573; R= 1,200 – 2,237).

Table 36. The number of waterbird species observed in Kolkheti National Park

N	Species	2003	2005	2006
1.	Podiceps cristatus	126	1280	9432
2.	Podiceps nigricollis	2		
3.	Pelecanus crispus			4
4.	Phalacrocorax carbo	2237	1283	1200
5.	Cygnus olor	5		
6.	Anas penelope	14		
7.	Anas strepera	2		
8.	Anas crecca	23		1800
9.	Anas platyrhynchos	16805	4800	17497
10.	Anas spp.		1141	1090
11.	Netta rufina	75		
12.	Aythya ferina	118		
13.	Aythya fuligula	1511	3	277
14.	Aythya marila			2
15.	Bucephala clangula	6		
16.	Melanitta fusca			3
17.	Mergellus albellus	2		
18.	Arenaria interpres			1
19.	Larus cachinnans	31		407
20.	Larus ridibundus	1360	1500	2000
21.	Prob.>99% Larus ridibundus	13900		
22.	Larus spp.		140	
	Total number of birds	**36217**	**10147**	**33713**
	Total number of species	**15**	**5**	**11**

2.5.3. Black Sea Coast adjacent to Kolkheti National Park

During three counts 20 waterbird species were observed (Table 37). The average number of birds per count was 27,754 (R= 4,762 – 53,245). The average number of species was – 10 (R= 4 – 16). The most numerous species during the counts were *Podiceps cristatus* (A= 5,645; R= 3,130 – 10,000), *Larus ridibundus* (A= 5,000; R= 1 – 15,000) and *Phalacrocorax carbo* (A= 1,542; R= 13 – 3,070).

Table 37. The number of waterbird species observed along the Black Sea Coast adjacent to Kolkheti National Park

N	Species	2003	2005	2006
1.	Tachybaptus ruficollis			10
2.	Podiceps cristatus	3805	3 130	10000
3.	Podiceps nigricollis	4	2	
4.	Phalacrocorax carbo	3070		13
5.	Egretta alba			2
6.	Anas strepera	22		
7.	Anas crecca	2		
8.	Anas platyrhynchos	626	15	
9.	Netta rufina			3
10.	Aythya ferina	2		18
11.	Aythya fuligula	395		7
12.	Bucephala clangula	1		
13.	Fulica atra			200
14.	Numenius arquata	18	15	
15.	Calidris alba	60		
16.	Stercorarius parasiticus	6		
17.	Larus cachinnans	204		1
18.	Larus ridibundus	1		15000
19.	Larus canus	3		
20.	Prob.>99% Larus ridibundus	45000		
21.	Larus spp.		1600	
22.	Sterna sandvicensis	26		
	Total number of birds	**53245**	**4762**	**25254**
	Total number of species	**16**	**4**	**10**

2.5.4. Partotskali Lake

During two counts 10 waterbird species were observed (Table 38). The average number of birds per count was 4,586 (R= 93 – 9,078). The average number of species was – 6 (R= 5 – 7). The most numerous species during the counts were *Anas platyrhynchos* (A= 4,080; R= 60 – 8,100), *Anas crecca* (900).

Table 38. The number of waterbird species observed at Partotskali Lake

N	Species	2003	2006
1.	Podiceps cristatus	10	
2.	Phalacrocorax carbo	3	1
3.	Cygnus olor		30

4.	Cygnus cygnus	11	
5.	Anas penelope		10
6.	Anas crecca		900
7.	Anas acuta		30
8.	Anas platyrhynchos	60	8100
9.	Netta rufina		7
10.	Aythya ferina	9	
	Total number of birds	**93**	**9078**
	Total number of species	**5**	**7**

2.5.5. Rioni River Delta

During three counts 28 waterbird species were observed (Table 39). The average number of birds per count was 17,298 (R= 6,813 – 29,850). The average number of species was – 14.7 (R= 8 – 18). The most numerous species during the counts were *Anas platyrhynchos* (A= 5,309; R= 6 – 15,000), *Larus ridibundus* (A= 3,017; R= 0 – 6,200), *Podiceps cristatus* (A= 1,505; R= 5 – 4,500) and *Anas crecca* (A= 797; R=12 – 1,380).

Table 39. The number of waterbird species observed in the Rioni River Delta

N	Species	2003	2005	2006
1.	Gavia arctica			1
2.	Podiceps cristatus	9	5	4500
3.	Pelecanus crispus			11
4.	Phalacrocorax carbo		300	150
5.	Ardea cinerea	14		
6.	Egretta alba	1	2	2
7.	Botaurus stellaris	1		
8.	Anser albifrons	1		
9.	Cygnus olor	1		
10.	Cygnus cygnus	47		4
11.	Tadorna tadorna			1
12.	Anas crecca	12	1380	1000
13.	Anas acuta			500
14.	Anas platyrhynchos	6	920	15000
15.	Aythya ferina	31	6	
16.	Aythya fuligula	1		
17.	Bucephala clangula	4		200
18.	Mergellus albellus	1		300
19.	Mergus merganser			1
20.	Fulica atra	43		6
21.	Pluvialis apricaria	39		
22.	Lymnocriptes minimus	1		

23.	Calidris alpina	11		
24.	Calidris alba	8		
25.	Larus cachinnans		150	1760
26.	Larus ichthyaetus			4
27.	Larus ridibundus		2850	6200
28.	Prob.>99% Larus ridibundus	15000		
29.	Larus genei			210
30.	Larus spp.		1200	
	Total number of birds	**15231**	**6813**	**29850**
	Total number of species	**18**	**8**	**18**

2.5.6. Paliastomi Lake

During four counts 37 waterbird species were observed (Table 40). The average number of birds per count was 27,170 (R= 4,340 – 45,422). The average number of species was – 17.8 (R= 10 – 23). The most numerous species during the counts were *Anas platyrhynchos* (A= 19,835; R= 0 – 38,000), *Anas crecca* (A= 2,899; R= 0 – 8,600), *Larus ridibundus* (A= 825; R= 0 – 2,900), *Aythya fuligula* (A= 393; R= 168 – 702) and *Aythya ferina* (A= 391; R= 150 – 650).

Table 40. The number of waterbird species observed at Paliastomi Lake

N	Species	1998	2003	2005	2006
1.	Tachybaptus ruficollis	20	2	7	
2.	Podiceps cristatus	538	128	160	
3.	Podiceps nigricollis	59	12	5	
4.	Podiceps grisegena	1			
5.	Phalacrocorax carbo	250	2		5
6.	Ardea cinerea	3	1	1	3
7.	Egretta alba	15	2		17
8.	Egretta garzetta	2			1
9.	Anser albifrons		16		
10.	Anser anser		1		30
11.	Anser spp.	15			
12.	Pelecanus crispus	3			
13.	Cygnus olor		17	7	35
14.	Cygnus cygnus				2
15.	Tadorna tadorna		1		
16.	Anas penelope		12		
17.	Anas crecca	8600	994		2000
18.	Anas acuta	75			
19.	Anas platyrhynchos	34400	6941		38000
20.	Prob.>99% Anas platyrhynchos	1	5500		

21.	Anas strepera	215			
22.	Oxyura leucocephala	2			
23.	Netta rufina		16		
24.	Aythya ferina	650	373		150
25.	Aythya fuligula	500	702	168	200
26.	Aythua nyroca		1		
27.	Aythya marila		1		
28.	Anas, Aythya - mixed			3520	
29.	Bucephala clangula	25	9		
30.	Mergellus albellus	1	7		
31.	Mergus serrator		2		
32.	Haliaeetus albicilla	13			
33.	Fulica atra	25	48	50	750
34.	Vanellus vanellus				10
35.	Numenius arquata			17	12
36.	Larus cachinnans		6		17
37.	Larus ichthyaetus	1			3
38.	Larus minutus	8			
39.	Larus ridibundus		2900	400	
40.	Sterna sandvicensis		8		
41.	Sterna spp.			5	
	Total number of birds	**45422**	**17684**	**4340**	**41235**
	Total number of species	**23**	**22**	**10**	**16**

2.5.7. Peat Cuttings (South of Paliastomi)

During four counts 27 waterbird species were observed (Table 41). The average number of birds per count was 1,047 (R= 408 – 1,814). The average number of species was – 14.7 (R= 8 – 19). The most numerous species during the counts were *Anas crecca* (A= 365; R= 1 – 1,200), *Anas platyrhynchos* (A= 205; R= 9 – 550) and *Aythya fuligula* (A= 152; R= 67 – 335).

Table 41. The number of waterbird species observed at the Peat Cuttings

N	Species	1998	2003	2005	2006
1.	Gavia arctica		1		
2.	Tachybaptus ruficollis	7	5		
3.	Podiceps cristatus	192	32		19
4.	Podiceps nigricollis	5	7		
5.	Podiceps grisegena	2			
6.	Phalacrocorax carbo	14	5		
7.	Ardea cinerea	3	3	3	1
8.	Egretta alba		1		1
9.	Cygnus olor		7		
10.	Tadorna tadorna	15			

11.	Anas penelope				3
12.	Anas crecca	1200	20	240	1
13.	Anas platyrhynchos	79	9	180	550
14.	Netta rufina	1			
15.	Aythya ferina	92	98		81
16.	Aythya fuligula	96	67	335	108
17.	Aythya marila	12			4
18.	Bucephala clangula	18	2	3	
19.	Mergellus albellus	25	39		19
20.	Mergus merganser			19	
21.	Mergus serrator	18	5		19
22.	Fulica atra	25	42	90	65
23.	Vanellus vanellus		60	190	
24.	Gallinago gallinago		1		
25.	Larus cachinnans				21
26.	Larus ichthyaetus				1
27.	Sterna sandvicensis		4		7
28.	Sterna spp.	10		5	
	Total number of birds	**1814**	**408**	**1065**	**900**
	Total number of species	**17**	**19**	**8**	**15**

2.5.8. Khidmaghala Fishponds

During three counts 30 waterbird species were observed (Table 42). The average number of birds per count was 392 (R= 236 – 510). The average number of species was – 13.0 (R= 9 – 19). The most numerous species during the counts were *Aythya fuligula* (A= 78; R= 0 – 220), *Anas acuta* (A= 58; R= 0 – 140), *Fulica atra* (A= 43; R= 0 – 130); *Aythya ferina* (A= 41; R= 0 – 120), *Anser albifrons* (A= 36; R= 0 – 100).

Table 42. The number of waterbird species observed at Khidmaghala Fishponds

N	Species	1998	2003	2006
1.	Gavia arctica	1		
2.	Podiceps cristatus	21		
3.	Phalacrocorax carbo	9		6
4.	Ardea cinerea		2	16
5.	Egretta alba		3	41
6.	Egretta garzetta			4
7.	Anser albifrons	8		100
8.	Cygnus cygnus		70	
9.	Cygnus olor		20	
10.	Tadorna tadorna	6		30
11.	Anas crecca		1	

12.	Anas platyrhynchos	38		4
13.	Anas penelope	2		
14.	Anas strepera	32		
15.	Anas acuta	35		140
16.	Anas clypeata	14		
17.	Netta rufina		1	
18.	Aythya ferina	3	120	
19.	Aythya nyroca		4	
20.	Aythya fuligula	220	15	
21.	Mergellus albellus			30
22.	Fulica atra			130
23.	Numenius arquata			9
24.	Recurvirostra avosetta	6		
25.	Tringa ochropus	1		
26.	Tringa erythropus	1		
27.	Sterna sandvicensis	7		
28.	Larus minutus	16		
29.	Larus ridibundus	8		
30.	Larus canus	1		
	Total number of birds	**429**	**236**	**510**
	Total number of species	**19**	**9**	**11**

2.5.9. Ispani Marshes (Kobuleti National Reserve)

During the 17.02. 2006 count in Kobuleti National Reserve were observed only 700 *Anas platyrhynchos*.

2.5.10. Chorokhi River Delta

During three counts 27 waterbird species were observed (Table 43). The average number of birds per count was 9,836 (R= 5,297 – 12,822). The average number of species was – 13.7 (R= 3 – 20). The most numerous species during the counts were *Larus cachinnans* (A= 4,480; R= 0 – 12,440), *Fulica atra* (A= 1,002; R= 0 – 2,800), *Podiceps cristatus* (A= 914; R= 0 – 1,500) and *Anas platyrhynchos* (A= 383; R= 34 – 732).

Table 43. The number of waterbird species observed in the Chorokhi River Delta

N	Species	1995	2003	2006
1.	Gavia arctica	8		2
2.	Tachybaptus ruficollis	39		
3.	Podiceps cristatus	1242		1500
4.	Podiceps nigricollis	38		
5.	Puffinus yelkouan	7		
6.	Pelecanus crispus			2
7.	Phalacrocorax carbo	163		148
8.	Ardea cinerea	18		2

9.	Egretta alba	4		9
10.	Egretta garzetta	11		
11.	Botaurus stellaris			6
12.	Anser albifrons			75
13.	Anser anser	2		173
14.	Cygnus olor		175	15
15.	Cygnus cygnus	4	207	52
16.	Anas penelope	51		
17.	Anas strepera	24		
18.	Anas platyrhynchos	732		34
19.	Anas querquedula	277		
20.	Anas clypaeta	9		
21.	Anas spp.	149		
22.	Netta rufina			16
23.	Aythya ferina	22		60
24.	Aythya fuligula	413		
25.	Mergellus albellus	4		29
26.	Fulica atra	206		2800
27.	Gallinago gallinago			4
28.	Larus cachinnans		12440	1000
29.	Larus spp.	7336		
	Total number of birds	**10759**	**12822**	**5927**
	Total number of species	**20**	**3**	**18**

2.5.11. Additional data from different parts of the Georgian Coast

Along the Black Sea Coast between Sarpi and River Choloki 16-17.12.1995 were observed 15,638 waterbirds of 20 species (Table 44). The most numerous species were *Podiceps cristatus* (3,894 /24.90%), *Aythya fuligula* (1,963 /12.55) and *Phalacrocorax carbo* (1,223 / 7.82). A large proportion of counted birds was not identified at species level - *Larus spp.* (6,740 / 43.10)

Table 44. The number of waterbird species observed along the Black Sea Coast between Sarpi and River Choloki

№	Species	Black Sea Coast (1995)		
		Sarpi – Chorokhi	Makhinjauri – Kobuleti	Kobuleti – River Choloki
1.	Gavia arctica	14	21	9
2.	Gavia stellata	4	3	
3.	Tachybaptus ruficollis		4	
4.	Podiceps cristatus	1192	2214	488
5.	Podiceps nigricollis	4	27	22
6.	Podiceps grisegena	16	2	9
7.	Podiceps spp	41	182	133
8.	Puffinus yelkouan	2	1	3
9.	Phalacrocorax carbo	1102	48	73

10.	Anser albifrons	7		
11.	Cygnus olor	1	2	
12.	Cygnus cygnus	11	6	
13.	Tadorna tadorna	2		
14.	Anas strepera	1	3	
15.	Anas spp.	178	73	86
16.	Anas platyrhynchos	144	89	101
17.	Anas querquedula	292	203	93
18.	Anas clypaeta	3		
19.	Anas acuta	1		
20.	Aythya fuligula	886	562	515
21.	Mergellus albellus	7	4	2
22.	Fulica atra	9	3	
23.	Larus spp.	4266	1607	867
	Total number of birds	**8183**	**5054**	**2401**
	Total number of species	**19**	**16**	**10**

During 22-24.01.2003 in the coastal area between Batumi and Poti 155,938 waterbirds of 12 species were counted (Table 45). The most numerous were *Podiceps cristatus* (48,900 / 42.18%), *Larus ridibundus* (40,600 / 35.02), *Larus cachinnans* (14,800 / 12.77) and *Aythya fuligula* (7,550 / 6.51)

Table 45. The number of waterbird species observed along the Black Sea Coast between Batumi and Poti

	Species	**Black Sea Coast (2003)**		
		Batumi – Kobuleti	**Kobuleti – Ureki**	**Ureki – Poti**
1.	Gavia arctica	4		
2.	Podiceps cristatus	30600	9100	9200
3.	Podiceps nigricollis	2		
4.	Phalacrocorax carbo	1665	25	395
5.	Anser anser		60	
6.	Cygnus olor		6	
7.	Anas platyrhynchos		1400	170
8.	Anas crecca		360	
9.	Aythya fuligula		400	7150
10.	Bucephala clangula			1
11.	Larus ridibundus	40500		100
12.	Larus cachinnans	9200	5500	100
	Total number of birds	**81971**	**16851**	**17116**
	Total number of species	**6**	**8**	**7**

3. Turkey

Kiraz Erciyas

Turkey is among the richest countries in Europe for birds because of its considerable diversity of habitats and its geographical position, situated at the junction of the Asian, European and African continents. Turkey has 135 wetland areas that are of international importance (Lise and Akarsu, 2007) and has declared 13 Ramsar Sites since 1994. Many species of waterfowl find suitable conditions for wintering in the wetlands of Turkey.

3.1. Coordination of counts, network of counters and methodological aspects of the counts

Doğa Derneği (DD) has been carrying out Midwinter Waterfowl Counts and coordinating the Common Bird Monitoring Scheme in collaboration with the network of birdwatchers in the country. The only study constructing the basis of International Waterbird Counts (IWC) in Turkey is the Midwinter Waterfowl Count. There are not specific birdwatching activities in wetlands and those that are carried out do not follow specific methodologies. There is a national level data base where count data is accumulated.

A territorial scheme for conducting counts along the Black Sea Coast is established. The list of key sites for wintering waterbird counts is given below (order of sites from east to west given in accordance to general numbering of the sites for all three countries) and presented in Pic 6:

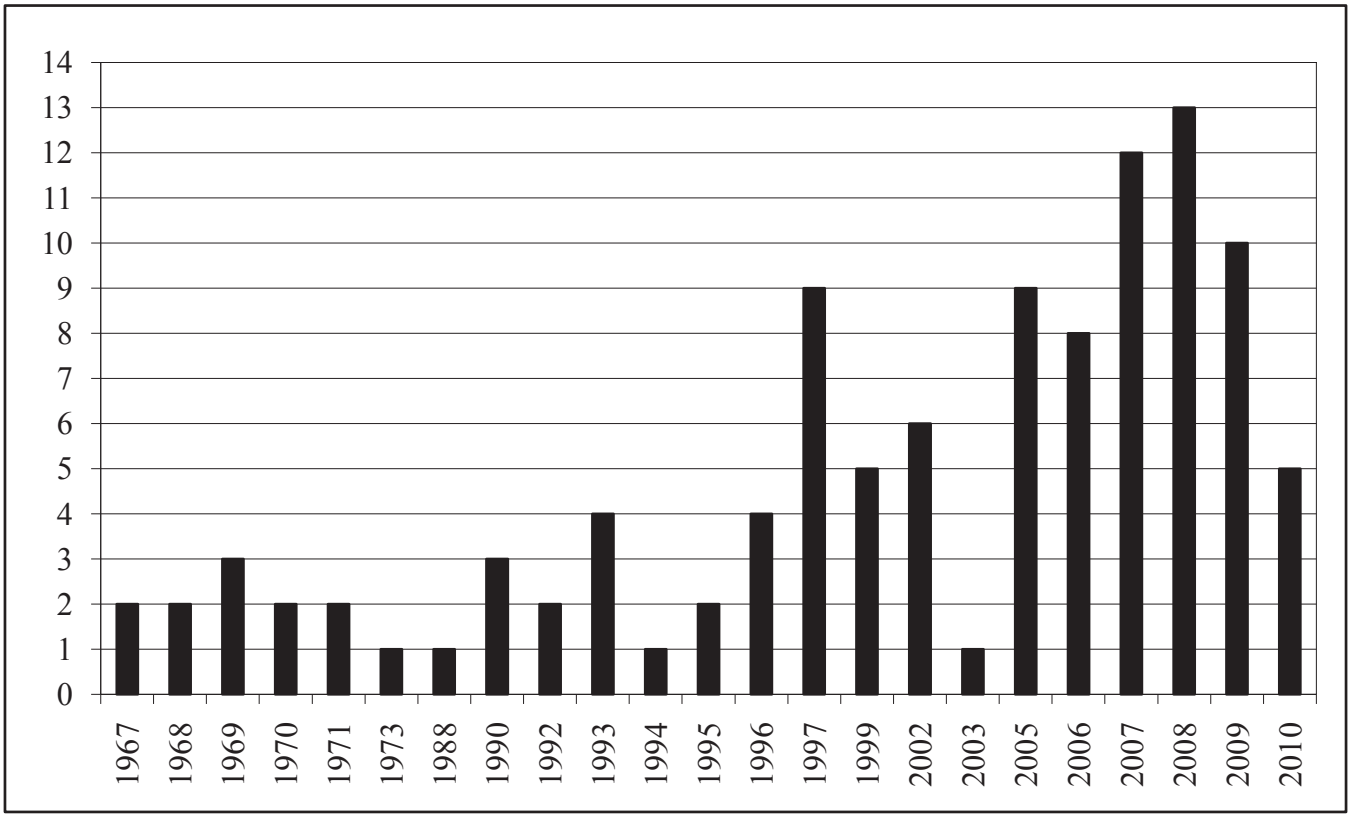
– Artvin Coast
– Rize Coast
– Trabzon Coast
– Giresun Coast
– Ordu Coast
– Samsun Coast
– Yeşilırmak Delta
– Kızılırmak Delta
– Sinop Coast
– Sarıkum Lake
– Amasra Coast
– Zonguldak Coast (Kozlu – Ereğli)
– Sakarya Delta
– Istanbul Coast (Kilyos – Riva – Şile coasts)
– Bosphorus
– Terkos Lake
– İğneada

The biggest gap for the Midwinter Waterfowl Counts is the lack of experienced birdwatchers throughout the country. Experienced birdwatchers are generally concentrated in certain regions of the country, especially Marmara, Aegean, Western and Middle Black Sea regions. At the same time, for the long–term continuation of this activity, a local birdwatchers network is essential. Therefore, participation of young and enthusiastic birdwatchers in such monitoring schemes is important. And their skills in identification and counting should be increased through traning. Besides, there is a need for technical equipment that will allow them to carry out these surveys on a regular basis.

3.2. The time period and sites coverage

Welch and Welch (1997) did the first and only systematic count along the Turkish Black Sea Coast. In 1997 they counted in total 128,372 waterbirds of 64 species. In 1996 DHKD (Society for the Conservation of Nature) organized for that year National Waterfowl Counts in 67 wetlands throughout Turkey. The majority of sites covered were inland and therefore coastal species were under–represented.

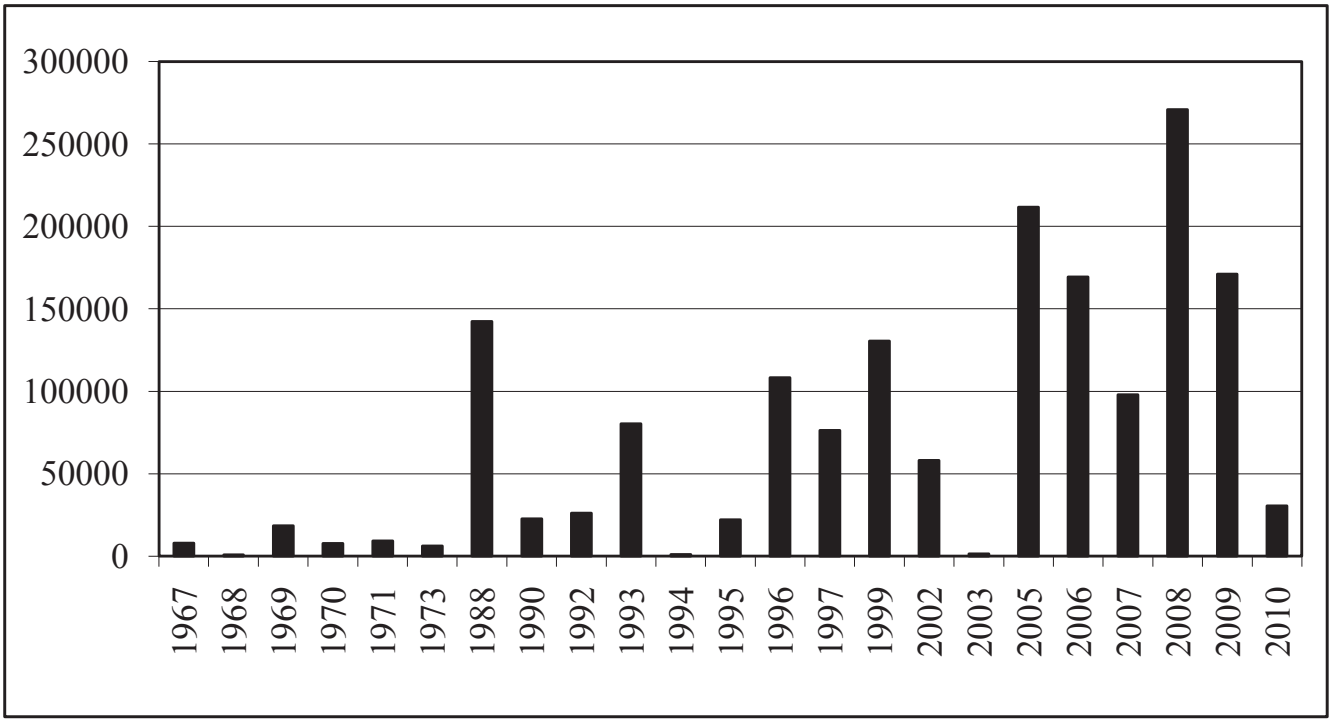
Midwinter Waterfowl Counts have been carried out irregularly since 1967 in Turkey and since 2003 DD has been coordinating the counts regularly (every year since 2005). The number of sites counted along the Black Sea Coast reached its maximum 13 in 2008, when all impotant sites in the region were covered (Pic.9). Detailed information on sites coverage is presented in Table 46.



Pic. 9 Number of sites counted during the MWC 1967 – 2010

Table 46. Sites coverage during the MWC 1967 – 2010

Site name	1967	1968	1969	1970	1971	1973	1988	1990	1992	1993	1994	1995	1996	1997	1999	2002	2003	2005	2006	2007	2008	2009	2010
Artvin Coast																				1	1		
Rize Coast														1				1		1	1		
Trabzon Coast																				1	1		
Giresun Coast														1							1		
Ordu Coast																			1				
Samsun Coast				1	1			1								1		1	1				
Yeşilırmak Delta	1		1	1	1	1				1		1	1	1	1	1		1	1	1	1	1	
Kizilirmak Delta							1	1	1	1			1		1	1		1	1	1	1	1	
Sinop Coast														1				1	1	1	1	1	
Sarikum Lake										1			1		1	1	1	1	1	1	1	1	
Amasra Coast														1							1	1	1
Zonguldak Coast																						1	
Sakarya Delta		1	1					1										1	1	1	1		1
Istanbul Coast														1						1		1	
Bosphorus														1	1	1		1		1	1	1	1
Terkos Lake	1	1	1							1		1	1	1	1	1		1	1	1	1	1	1
Igneada									1		1			1						1	1	1	1
Total	**2**	**2**	**3**	**2**	**2**	**1**	**1**	**3**	**2**	**4**	**1**	**2**	**4**	**9**	**5**	**6**	**1**	**9**	**8**	**12**	**13**	**10**	**5**

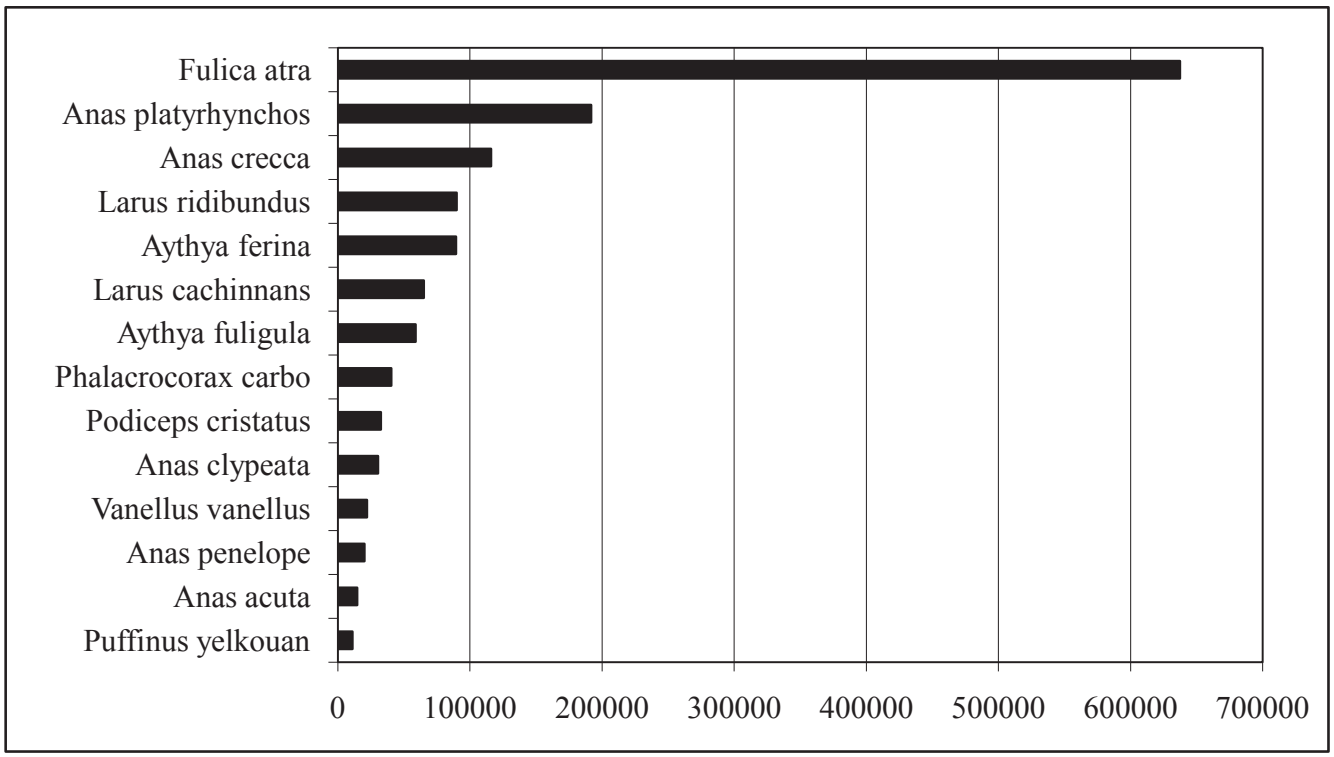


Pic. 10 Number of waterbirds counted during the MWC 1967 – 2010

3.3. Species coverage and general count results

For the period 1967 – 2010 a total of 1,670,072 waterbirds of 97 species have been counted, the number varying from 799 in 1968 to 270,890 in 2008 (Pic.10).

Among them the most numerous species were *Fulica atra* (637,499 birds / 38.17%), *Anas platyrhynchos* (191,571 / 11.47%) and *Anser crecca* (115,873 / 6.94%). The next common 9 species were much less numerous, but nevertheless the total for each of these species exceeds 20 thousand birds: *Larus ridibundus* – 89,889, *Aythya ferina* – 89,499, *Larus cachinnans* – 64,890, *Aythya fuligula* – 58,750, *Phalacrocorax carbo* – 40,502, *Podiceps cristatus* – 32,561, *Anas clypeata* – 30,360, *Vanellus vanellus*



Pic. 11 The most common waterbird species observed at sites along the Turkish Black Sea coast

– 21,874 and *Anas penelope* – 20,112. (See Pic.11 and Table 47).

Comparison of the ratios of different taxonomic groups shows that the most numerous are Gruiformes – 640,662 birds / 38.36%, Anseriformes – 616,568 / 36.91% and Charadriiformes – 207,506 /12.43%. Birds of other taxonomic groups were less numerous: Pelecaniformes – 47,872 / 2.86%, Podicipediformes – 37,089 / 2.22%, Procellariiformes – 11,009 / 0.66%, Gaviiformes – 4,622 / 0.28%, Ciconiiformes – 2,735 / 0.17%, Phoenicopteriformes – 6 / 0.0004%.

Table 47. The total numbers of birds counted during period 1967 – 2010

Order	Family	Species	Total	%
Gaviiformes	Gaviidae	Gavia stellata	19	<0.01
Gaviiformes	Gaviidae	Gavia arctica	4603	0.28
		Sub–total	***4622***	***0.28***
Podicipediformes	Podicipedidae	Tachybaptus ruficollis	1780	0.11
Podicipediformes	Podicipedidae	Podiceps nigricollis	2721	0.16
Podicipediformes	Podicipedidae	Podiceps grisegena	27	<0.01
Podicipediformes	Podicipedidae	Podiceps cristatus	32561	1.95
		Sub–total	***37089***	***2.22***
Procellariiformes	Procellariidae	Puffinus yelkouan	11009	0.66
		Sub–total	***11009***	***0.66***
Pelecaniformes	Pelecanidae	Pelecanus onocrotalus	1	<0.01
Pelecaniformes	Pelecanidae	Pelecanus crispus	54	<0.01
Pelecaniformes	Phalacrocoracidae	Phalacrocorax carbo	40502	2.43
Pelecaniformes	Phalacrocoracidae	Phalacrocorax aristotelis	3173	0.19
Pelecaniformes	Phalacrocoracidae	Phalacrocorax pygmeus	4142	0.25
		Sub–total	***47872***	***2.87***
Ciconiiformes	Ardeidae	Botaurus stellaris	49	<0.01
Ciconiiformes	Ardeidae	Bubulcus ibis	3	<0.01
Ciconiiformes	Ardeidae	Egretta alba	1048	0.06
Ciconiiformes	Ardeidae	Egretta garzetta	682	0.04
Ciconiiformes	Ardeidae	Ardea cinerea	862	0.05
Ciconiiformes	Threskiornithidae	Platalea leucorodia	4	<0.01
Ciconiiformes	Threskiornithidae	Plegadis falcinellus	65	<0.01
Ciconiiformes	Ciconiidae	Ciconia ciconia	3	<0.01
Ciconiiformes	Ciconiidae	Ciconia nigra	19	<0.01
		Sub–total	***2735***	***0.16***
Phoenicopteriformes	Phoenicopteridae	Phoenicopterus roseus	6	<0.01
		Sub–total	***6***	***<0.01***
Anseriformes	Anatidae	Branta ruficollis	52	<0.01
Anseriformes	Anatidae	Anser anser	1886	0.11
Anseriformes	Anatidae	Anser albifrons	4242	0.25
Anseriformes	Anatidae	Cygnus olor	2479	0.15
Anseriformes	Anatidae	Cygnus cygnus	1024	0.06
Anseriformes	Anatidae	Cygnus columbianus	8	<0.01
Anseriformes	Anatidae	Tadorna ferruginea	914	0.05
Anseriformes	Anatidae	Tadorna tadorna	3371	0.20

Anseriformes	Anatidae	Anas platyrhynchos	191571	11.47
Anseriformes	Anatidae	Anas crecca	115873	6.94
Anseriformes	Anatidae	Anas strepera	4481	0.27
Anseriformes	Anatidae	Anas penelope	20112	1.20
Anseriformes	Anatidae	Anas acuta	14669	0.88
Anseriformes	Anatidae	Anas querquedula	160	0.01
Anseriformes	Anatidae	Anas clypeata	30360	1.82
Anseriformes	Anatidae	Anatinae spp.	66364	3.97
Anseriformes	Anatidae	Netta rufina	6312	0.38
Anseriformes	Anatidae	Aythya ferina	89499	5.36
Anseriformes	Anatidae	Aythya nyroca	56	<0.01
Anseriformes	Anatidae	Aythya fuligula	58750	3.52
Anseriformes	Anatidae	Aythya marila	47	<0.01
Anseriformes	Anatidae	Aythya spp.	215	0.01
Anseriformes	Anatidae	Clangula hyemalis	1	<0.01
Anseriformes	Anatidae	Bucephala clangula	1056	0.06
Anseriformes	Anatidae	Somateria mollissima	14	<0.01
Anseriformes	Anatidae	Melanitta nigra	2	<0.01
Anseriformes	Anatidae	Melanitta fusca	711	0.04
Anseriformes	Anatidae	Oxyura leucocephala	1475	0.09
Anseriformes	Anatidae	Mergellus albellus	610	0.04
Anseriformes	Anatidae	Mergus serrator	246	0.01
Anseriformes	Anatidae	Mergus merganser	8	<0.01
		Sub–total	***616568***	***36.92***
Gruiformes	Gruidae	Grus grus	2	<0.01
Gruiformes	Rallidae	Rallus aquaticus	137	0.01
Gruiformes	Rallidae	Gallinula chloropus	240	0.01
Gruiformes	Rallidae	Porphyrio porphyrio	2784	0.17
Gruiformes	Rallidae	Fulica atra	637499	38.17
		Sub–total	***640662***	***38.36***
		Anatinae / Fulica atra	11281	0.68
		Sub–total	***11281***	***0.68***
Charadriiformes	Charadriidae	Pluvialis squatorola	211	0.01
Charadriiformes	Charadriidae	Pluvialis apricaria	5276	0.32
Charadriiformes	Charadriidae	Charadrius hiaticula	41	<0.01
Charadriiformes	Charadriidae	Charadrius dubius	9	<0.01
Charadriiformes	Charadriidae	Charadrius alexandrinus	27	<0.01
Charadriiformes	Charadriidae	Vanellus vanellus	21874	1.31
Charadriiformes	Charadriidae	Himantopus himantopus	3	<0.01
Charadriiformes	Charadriidae	Recurvirostra avosetta	13	<0.01
Charadriiformes	Haematopidae	Haematopus ostralegus	23	<0.01
Charadriiformes	Scolopacidae	Tringa ochropus	65	<0.01
Charadriiformes	Scolopacidae	Tringa nebularia	61	<0.01

Charadriiformes	Scolopacidae	Tringa totanus	902	0.05
Charadriiformes	Scolopacidae	Tringa erythropus	66	<0.01
Charadriiformes	Scolopacidae	Tringa stagnatilis	2	<0.01
Charadriiformes	Scolopacidae	Actitis hypoleucos	10	<0.01
Charadriiformes	Scolopacidae	Philomachus pugnax	30	<0.01
Charadriiformes	Scolopacidae	Calidris minuta	1889	0.11
Charadriiformes	Scolopacidae	Calidris temminckii	72	<0.01
Charadriiformes	Scolopacidae	Calidris alpina	1685	0.10
Charadriiformes	Scolopacidae	Calidris minuta/alpina	50	<0.01
Charadriiformes	Scolopacidae	Calidris canutus	5	<0.01
Charadriiformes	Scolopacidae	Calidris alba	61	<0.01
Charadriiformes	Scolopacidae	Gallinago gallinago	401	0.02
Charadriiformes	Scolopacidae	Scolopax rusticola	13	0.00
Charadriiformes	Scolopacidae	Numenius arquata	583	0.03
Charadriiformes	Scolopacidae	Numenius phaeopus	2	<0.01
Charadriiformes	Scolopacidae	Limosa limosa	1700	0.10
Charadriiformes	Scolopacidae	Limosa lapponica	7	<0.01
Charadriiformes		Charadrii spp.	210	0.01
Charadriiformes	Stercorariidae	Stercorarius parasiticus	4	<0.01
Charadriiformes	Laridae	Larus ichthyaetus	119	0.01
Charadriiformes	Laridae	Larus melanocephalus	431	0.03
Charadriiformes	Laridae	Larus minutus	1815	0.11
Charadriiformes	Laridae	Larus ridibundus	89889	5.38
Charadriiformes	Laridae	Larus genei	50	<0.01
Charadriiformes	Laridae	Larus fuscus	76	<0.01
Charadriiformes	Laridae	Larus cachinnans	64890	3.89
Charadriiformes	Laridae	Larus michahellis	7548	0.45
Charadriiformes	Laridae	Larus armenicus	150	0.01
Charadriiformes	Laridae	Larus canus	6500	0.39
Charadriiformes	Laridae	Larus spp.	495	0.03
Charadriiformes	Laridae	Rissa tridactyla	5	<0.01
Charadriiformes	Laridae	Sterna caspia	1	<0.01
Charadriiformes	Laridae	Sterna sandvicensis	242	0.01
		Sub–total	***207506***	***12.42***
		Unidentified waterbirds	***90722***	***5.43***
		TOTAL	**1670072**	**100.00**

3.4. Waterbird count results for key Black Sea coastal wetlands of Turkey

3.4.1. Artvin Coast

Stretches from Fındıklı to Sarp (Georgian border). The area includes small river mouths and the ports of Hopa and Arhavi.

The MWC resuls are given in Table 48. During two counts 17 waterbird species were observed. The average number of birds per count was 2,996 (R= 1,648 – 4,203). The average number of species was – 13 (R= 10 – 16). The most numerous spescies were *Phalacrocorax carbo* (A= 994; R= 532 – 1,456), *Larus ridibundus* (A= 543; R= 3 – 1,082), *Podiceps cristatus* (A= 319; R= 108 – 529).

Table 48. Numbers of wintering waterbirds counted on the Artvin Coast

N	Species	2007	2008
1.	Gavia arctica	207	284
2.	Tachybaptus ruficollis		5
3.	Podiceps nigricollis		10
4.	Podiceps cristatus	108	529
5.	Puffinus yelkouan	158	2
6.	Phalacrocorax carbo	532	1456
7.	Phalacrocorax aristotelis	341	9
8.	Ardea cinerea		1
9.	Aythya fuligula	3	30
10.	Bucephala clangula		1
11.	Fulica atra	69	511
12.	Larus melanocephalus	2	
13.	Larus ridibundus	3	1082
14.	Larus fuscus		1
15.	Larus michahellis	224	258
16.	Larus canus		16
17.	Sterna sandvicensis		8
18.	Unidentified waterbird	1	
	Total number of birds	**1648**	**4203**
	Total number of species	**10**	**16**

3.4.2. Rize Coast

Stretches from Iyidere to Ardeşen. The area includes small river mouths and the ports of Rize, Iyidere, Çayeli, Pazar and Ardeşen.

The MWC results are given in Table 49. As seen from the results, the area is important for wintering waterbirds. During four counts 32 waterbird species were observed. The average number of birds per count was 9,882 (R= 1,988 – 17,927). The average number of species was – 21.5 (R= 18 – 27). The most numerous spescies were *Larus cachinnans* (A= 3,362; R= 1,100 – 5,480, *Larus ridibundus* (A= 2,059; R= 15 – 4,981, *Fulica atra* (A= 1,539; R=175 – 3,211, *Podiceps cristatus* (A= 1,057; R= 362 – 1,763, *Phalacrocorax carbo* (A= 685; R= 66 – 2,044).

Table 49. Numbers of wintering waterbirds counted on the Rize Coast

N	Species	1997	2005	2007	2008
1.	Gavia stellata	1		1	
2.	Gavia arctica	455	3	300	476
3.	Tachybaptus ruficollis	11	4	9	391
4.	Podiceps nigricollis	47	3	14	98
5.	Podiceps grisegena	1			
6.	Podiceps cristatus	362	450	1651	1763
7.	Puffinus yelkouan	220			14
8.	Phalacrocorax carbo	66	145	483	2044
9.	Phalacrocorax aristotelis	3	3	97	
10.	Egretta alba				2
11.	Ardea cinerea		1	4	11
12.	Cygnus olor				79
13.	Cygnus cygnus		2		
14.	Anas platyrhynchos	148		36	194
15.	Anas crecca		1		
16.	Anas penelope	1			
17.	Aythya ferina	18		2	81
18.	Aythya fuligula	134	25	177	595
19.	Bucephala clangula	33			85
20.	Mergus serrator	13		3	9
21.	Fulica atra	2367	175	402	3211
22.	Stercorarius parasiticus	1			
23.	Larus ichthyaetus	1	8		
24.	Larus melanocephalus	162		8	13
25.	Larus minutus	65	4	115	183
26.	Larus ridibundus	1213	15	2027	4981
27.	Larus genei	1			
28.	Larus fuscus	54	3		2
29.	Larus cachinnans	5480	1100	3237	3629
30.	Larus armenicus	7			17
31.	Larus canus	163	25		19
32.	Larus spp.		15		
33.	Sterna sandvicensis	8	6	10	30
	Total number of birds	**11035**	**1988**	**8576**	**17927**
	Total number of species	**27**	**18**	**18**	**23**

3.4.3. Trabzon Coast

Stretches from Beşikdüzü to Of. The site includes the mouths of small rivers and the ports of Trabzon, Beşikdüzü, Akçaabat, Arsin, Sürmene and Of.

The area is important for wintering waterbirds. MWC results are given in Table 50. During two counts 22 waterbird species were observed. The average number of birds per count was 8,457 (R= 7,241 – 9,672). The average number of species was – 16.5 (R= 13 – 20). The most numerous species were *Larus michahellis* (A= 3,533; R= 3,152 – 3,914), *Podiceps cristatus* (A= 1,558; R= 1,073 – 2,042), *Fulica atra* (A= 1,335; R= 753 – 1,916), *Phalacrocorax carbo* (A= 1,018; R= 844 – 1,191).

Table 50. Numbers of wintering waterbirds counted along the Trabzon Coast

N	Species	2007	2008
1.	Gavia arctica	134	448
2.	Tachybaptus ruficollis	2	3
3.	Podiceps nigricollis		15
4.	Podiceps cristatus	2042	1073
5.	Puffinus yelkouan		6
6.	Phalacrocorax carbo	844	1191
7.	Phalacrocorax aristotelis	162	
8.	Ardea cinerea	2	1
9.	Cygnus olor		21
10.	Cygnus cygnus		2
11.	Anas platyrhynchos	19	84
12.	Aythya ferina		55
13.	Aythya fuligula	39	271
14.	Bucephala clangula		36
15.	Fulica atra	753	1916
16.	Stercorarius parasiticus		1
17.	Larus melanocephalus		3
18.	Larus minutus	85	44
19.	Larus ridibundus	3	558
20.	Larus fuscus	4	
21.	Larus michahellis	3152	3914
22.	Larus canus		30
	Total number of birds	**7241**	**9672**
	Total number of species	**13**	**20**

3.4.4. Giresun Coast

The Giresun Coast stretches from Bulancak to Eynesil. Smaller streams flow into the Black Sea. Smaller boundary ports and Giresun port host most of the waterbirds in this area.

Two km N of the mainland is Giresun Island, which is important for wintering waterbirds: *Aythya fuligula* (14,550 indiv.), *Gavia arctica* (609 indiv.), *Melanitta fusca* (20 indiv.) (Eken et al., 2006). The MWC results are given in Table 51. During two counts 31 waterbird species were observed. The average number of birds per count was 13,931 (R= 4,526 – 23,336). The average number of species was – 23

(R= 18 – 28). The most numerous spescies were *Aythya fuligula* (A= 5,454; R= 132 – 10,775), *Fulica atra* (A= 2,443; R= 400 – 4,486), *Larus cachinnans* (A= 1,724; R= 1,370 – 2,077), *Phalacrocorax carbo* (A= 1,393; R=731 – 2,055), *Podiceps cristatus* (A= 933; R= 88 – 1,777), *Larus ridibundus* (A= 926, R =343 – 1,509).

Table 51. Numbers of wintering waterbirds counted on the Giresun Coast

N	Species	1997	2008
1.	Gavia stellata	1	9
2.	Gavia arctica	609	
3.	Tachybaptus ruficollis	9	4
4.	Podiceps nigricollis	187	70
5.	Podiceps grisegena	1	
6.	Podiceps cristatus	1777	88
7.	Puffinus yelkouan	274	
8.	Phalacrocorax carbo	731	2055
9.	Phalacrocorax aristotelis		3
10.	Egretta alba	1	
11.	Ardea cinerea	11	2
12.	Cygnus olor		13
13.	Cygnus cygnus	1	
14.	Anas platyrhynchos	235	14
15.	Anas crecca	53	1
16.	Anas penelope	5	
17.	Aythya ferina	77	16
18.	Aythya fuligula	10775	132
19.	Aythya marila	3	
20.	Bucephala clangula	125	
21.	Mergellus albellus	2	
22.	Mergus serrator	10	
23.	Fulica atra	4486	400
24.	Gallinago gallinago		1
25.	Stercorarius parasiticus	1	
26.	Larus melanocephalus	5	
27.	Larus minutus	16	
28.	Larus ridibundus	1509	343
29.	Larus cachinnans	2077	1370
30.	Larus canus	347	1
31.	Sterna sandvicensis	8	4
	Total number of birds	**23336**	**4526**
	Total number of species	**28**	**18**

3.4.5. Ordu Coast

This area stretches from Ünye to Giresun city border (Bulancak). It includes the Melet River, some smaller streams, and some islands (Akkuş island). Habitats consist of rocky cliffs, river mouths and coastline. After the Sarp – Samsun road was built next to the coast, all coastal dunes were destroyed. Only some rocky cliffs, harbours and the Black Sea itself serves as suitable habitat for the birds.

Only in 2006 was MWC performed in this area (Table 52). Even in KusBank (the internet based Turkish Bird Database) thereare very few records about the area, which makes it very difficult to make an assessment about the area. There is a serious need for monitoring needs to be done in the coastal area.

During the count a total of 17,061 waterbirds of species were observed. The most numerous spescies were *Larus cachinnans* (4,478), *Aythya fuligula* (4,153), *Fulica atra* (2,656) and *Podiceps cristatus* (1,330).

Table 52. Numbers of wintering waterbirds counted on the Ordu Coast

N	Species	2006
1.	Gavia arctica	60
2.	Tachybaptus ruficollis	5
3.	Podiceps nigricollis	83
4.	Podiceps cristatus	1330
5.	Phalacrocorax carbo	600
6.	Phalacrocorax aristotelis	20
7.	Phalacrocorax pygmeus	4
8.	Botaurus stellaris	1
9.	Egretta alba	1
10.	Ardea cinerea	11
11.	Cygnus olor	9
12.	Anas platyrhynchos	143
13.	Anas penelope	3
14.	Aythya ferina	509
15.	Aythya fuligula	4153
16.	Aythya marila	6
17.	Bucephala clangula	9
18.	Mergellus albellus	2
19.	Fulica atra	2656
20.	Larus minutus	10
21.	Larus ridibundus	625
22.	Larus cachinnans	4478
23.	Larus armenicus	8
24.	Larus canus	890
25.	Unidentified waterbirds	1445
	Total number of birds	**17061**
	Total number of species	**24**

3.4.6. Samsun Coast

This area includes two small rivers (Mert and Kürtün) which flow into the Black Sea in the centre of Samsun. Samsun harbor is also very important for some waterbirds. Doğupark (next to the Mert River) is also very important for wintering waterbirds where a part of the port stretches.

Large numbers of *Larus cachinnans* and *Aythya fuligula* were counted. Since 2006 more than 1000 *Aythya fuligula, Larus cachinnans* and *Larus ridibundus* were counted on the Samsun Coast, mainly at Doğupark and Batıpark (OMÜKUŞ records, unpl.). The species biodiversity was higher before 2006. In Batıpark the Samsun Municipality reconstructed the area and destroyed the sand islands and sand dunes where high numbers of *Sterna sandwichensis* were wintering.

The results of MWC are given in Table 53. These results do not reflect the whole picture as the entire Samsun Coast area was not counted. In 1970 and 1971 there was access to Samsun port, now it is forbidden to enter. It is expected that the numbers would be much higher if the port could be counted.

During six MWC counts 19 waterbird species were observed. The average number of birds per count was 2,130 (R= 866 – 4,138). The average number of species was – 8.2 (R= 4 – 13). The most numerous spescies dirung the period of counting were *Aythya fuligula* (A= 1,196; R= 0 – 2,680), *Fulica atra* (A= 399; R= 15 – 900), *Larus ridibundus* (A= 152; R= 0 – 620), *Larus cachinnans* (A= 124; R= 0 – 715).

The Samsun Coast has not been counted with the same methodology every year. The changes in the numbers of birds counted can be explained partly by variations in the methodology used.

Table 53. Numbers of wintering waterbirds counted on the Samsun Coast

N	Species	1970	1971	1990	2002	2005	2006
1.	Gavia arctica			1	22		
2.	Tachybaptus ruficollis	45				4	4
3.	Podiceps nigricollis	73				1	4
4.	Podiceps cristatus	210		100	18	2	6
5.	Phalacrocorax carbo				55	2	17
6.	Egretta alba				4	1	
7.	Ardea cinerea					1	
8.	Anas platyrhynchos	100	245			69	
9.	Anas strepera	30					
10.	Anas penelope						1
11.	Aythya ferina	100	20	200	8		45
12.	Aythya fuligula	2680	2275	1640	321	260	
13.	Mergellus albellus						2
14.	Mergus serrator						5
15.	Fulica atra	900	690	15	250	68	473
16.	Larus minutus					82	
17.	Larus ridibundus					620	294
18.	Larus cachinnans				715	13	15
19.	Sterna sandvicensis					74	
	Total number of birds	**4138**	**3230**	**1956**	**1393**	**1197**	**866**
	Total number of species	**8**	**4**	**5**	**8**	**13**	**11**

Table 54. Numbers of wintering waterbirds counted in the Yeşilırmak Delta

N	Species	1967	1969	1970	1971	1973	1993	1995	1996	1997	1999	2002	2005	2006	2007	2008	2009
1.	Gavia arctica	1		70				2	3	23		2		7		2	24
2.	Tachybaptus ruficollis	38					6	35	27	20	17	7	4	39	12	1	19
3.	Podiceps nigricollis							27	19	90			24	57	2	22	88
4.	Podiceps grisegena													2			
5.	Podiceps cristatus	31					17	50	238	510	58	22	41	36		37	150
6.	Puffinus yelkouan													150		30	
7.	Phalacrocorax carbo								102	84		39	333	109	23	23	96
8.	Phalacrocorax pygmeus											27	179	96	181	192	116
9.	Botaurus stellaris															1	
10.	Bubulcus ibis	1															
11.	Egretta alba	13		5				6	6	2	13	18	7	32	4	10	26
12.	Egretta garzetta	1	1					3	7	3	6	16	2	13	12	10	15
13.	Ardea cinerea	11		1			2	3	2	2	6	5	3	26	6	19	15
14.	Branta ruficollis	1															
15.	Anser anser	80															1
16.	Anser albifrons	300	100							12				1		1	
17.	Cygnus olor								15			5		2		10	1
18.	Cygnus cygnus		4											14			12
19.	Tadorna ferruginea		500	186												1	
20.	Tadorna tadorna			2767		5								3			1
21.	Anas platyrhynchos	5040	4200	15	1100	5500		7750	4041	2460	312	11	5	457	4	31	4606
22.	Anas crecca	330	55		2505			2840	2300	48	90	14	19	2167		33	1
23.	Anas strepera					6		50				3		24			
24.	Anas penelope	40	1		600	100		250	1580	61	143	9		45			12
25.	Anas acuta			40	900	30			30	1				54			

26.	Anas clypeata				5			4	47	5	3	13		436		1	1
27.	Anatinae spp.		100			400						27					
28.	Netta rufina							520	155	3		2		39			16
29.	Aythya ferina		9			30	7	230	5400	66	70	148	23	716	7	790	49
30.	Aythya fuligula	1800	6000		135	100		72	398	875		51		67		35	47
31.	Aythya marila									4						7	2
32.	Bucephala clangula	2	61					37	8	52	58	36	2	1		7	139
33.	Melanitta fusca							57	485		43						
34.	Mergellus albellus		3							2							
35.	Mergus serrator							3	7	5				3		10	5
36.	Mergus merganser										1						
37.	Rallus aquaticus												4	1		1	2
38.	Gallinula chloropus									1			6	1	1		2
39.	Fulica atra			420	702		423	100	370	323		603	3370	4467	670	435	745
40.	Pluvialis squatarola									1						1	
41.	Pluvialis apricaria											70		550	60		
42.	Charadrius hiaticula									11							9
43.	Charadrius alexandrinus									1							11
44.	Vanellus vanellus							190	80	323		38	3	560		6	250
45.	Haematopus ostralegus							8			7						7
46.	Tringa ochropus											9		2		3	5
47.	Tringa nebularia											3					
48.	Tringa totanus											11				2	
49.	Calidris alpina																9
50.	Calidris alba																9
51.	Gallinago gallinago							4		2		7	16	5		7	
52.	Numenius arquata									53							
53.	Limosa limosa											1					
54.	Larus ichthyaetus															2	3

55.	Larus melanocephalus										1			1			
56.	Larus minutus											2		831			
57.	Larus ridibundus								300	52				9	2	280	890
58.	Larus fuscus												2				
59.	Larus cachinnans								600	517	98	4	8	9	6	41	330
60.	Larus armenicus															2	
61.	Larus canus									24	2			3			292
62.	Sterna sandvicensis									1				10			
63.	Anatinae / Fulica atra											20		261			
	Total number of birds	**7689**	**11034**	**3504**	**5947**	**6171**	**455**	**12241**	**16220**	**5637**	**928**	**1223**	**4051**	**11306**	**990**	**2053**	**8006**
	Total number of species	**15**	**11**	**8**	**7**	**7**	**5**	**22**	**24**	**33**	**17**	**28**	**19**	**39**	**14**	**33**	**37**

Table 55. Numbers of wintering waterbirds counted in the Kızılırmak Delta

N	Species	1988	1990	1992	1993	1996	1999	2002	2005	2006	2007	2008	2009
1.	Gavia stellata					1	1						
2.	Gavia arctica	140		1	1	3		37	81	18		42	502
3.	Tachybaptus ruficollis	22	5	7	10	14	23	26	24	34	26	47	65
4.	Podiceps nigricollis	21	3	50	17	77	2	13	52	9		59	61
5.	Podiceps grisegena				1	1				1			
6.	Podiceps cristatus	880	311	81	93	459	60	1253	68	935	77	292	2324
7.	Puffinus yelkouan		35							350			
8.	Pelecanus crispus		1	1	5	11		1	2	12	7	6	8
9.	Phalacrocorax carbo	43	272	26	108	108	11	99	86	802	73	48	296
10.	Phalacrocorax pygmeus				41		210	181	174	167	284	526	901
11.	Botaurus stellaris	1	1	2	2	1			1	2	1	13	1
12.	Bubulcus ibis									2			
13.	Egretta alba	39	9	6	46	30	43	20	67	34	39	62	83

14.	Egretta garzetta	8		8	8	42	98	10	159	7	48	37	125
15.	Ardea cinerea	26	1	6	12	12	8	15	50	29	66	37	51
16.	Plegadis falcinellus						5				60		
17.	Ciconia ciconia				1		1						
18.	Ciconia nigra						8			1	2		8
19.	Phoenicopterus roseus										6		
20.	Branta ruficollis									1			
21.	Anser anser	52	1	5	322	3	90	24	17	160		20	345
22.	Anser albifrons			7	1281	26				291			
23.	Cygnus olor	2	48	2	74	17	37	131	10	247		431	387
24.	Cygnus cygnus	15			19			30	25	400		1	229
25.	Cygnus columbianus												4
26.	Tadorna ferruginea				191		5	1		1			
27.	Tadorna tadorna						23	11	1	316	33	53	19
28.	Anas platyrhynchos	1200	5456	4099	9679	15753	6900	1504	50000	1297	180	8607	14676
29.	Anas crecca	320	6400	7302	7000	11050	9700	2473	30000	2804	2541	5855	14666
30.	Anas strepera	2	25	564	250	231	330	37	229	158	137	2153	198
31.	Anas penelope	94	21	248	667	2120	2800	110	475	1480	524	4670	2238
32.	Anas acuta	7	380	163	680	1342	3850	56	844	978	339	2239	2293
33.	Anas clypeata	14	177	3115	4564	3375	5930	578	3000	382	1290	2236	4940
34.	Anatinae spp.	8500		750	661			2730				46700	6380
35.	Netta rufina	86	10	36	184	403	1826	8	151	9	7	478	2218
36.	Aythya ferina	980	1152	700	1025	5182	6850	547	549	3974	2772	23877	6759
37.	Aythya nyroca										10	7	7
38.	Aythya fuligula	1560	1506	691	208	4350	88	159	437	843	389	204	251
39.	Aythya marila				4			1		2			
40.	Bucephala clangula	25	1			22	1			25	2	67	22
41.	Melanitta fusca	28				97							
42.	Oxyura leucocephala		2	73	22	3	830	52	341		42	2	44

43.	Mergellus albellus			3	9		4	4		5		2	
44.	Mergus serrator	9		25					6	2		2	3
45.	Mergus merganser			2					3	1			
46.	Grus grus					1	1						
47.	Rallus aquaticus	100	1	1					4		1	9	4
48.	Gallinula chloropus	4	2				22		19	18	64	32	6
49.	Porphyrio porphyrio						8	2	1044	505	265	959	1
50.	Fulica atra	125000	2557	6393	28293	30511	55000	10795	57186	41459	39119	75713	56364
51.	Pluvialis squatarola	52		4	1	7	19	8	1		5	71	
52.	Pluvialis apricaria	35	15	300	502	1389	260	344	604	300	807	7	
53.	Charadrius hiaticula					14					5	1	
54.	Charadrius dubius					1			8				
55.	Charadrius alexandrinus	14										1	
56.	Vanellus vanellus	1900	366	450	1344	2303	3520	989	1561		2306	1430	3274
57.	Himantopus himantopus											3	
58.	Recurvirostra avosetta	7			5								
59.	Tringa ochropus	2	1		5		1	2	10	5	2	3	5
60.	Tringa nebularia				1	28	25		1	1			
61.	Tringa totanus	15	19	50	210	72	164	25		31	130	77	91
62.	Tringa erythropus				5				51	7			3
63.	Tringa stagnatilis					1				1			
64.	Actitis hypoleucos	1	2						6			1	
65.	Philomachus pugnax				25						3	1	
66.	Calidris minuta	26	45			570	540	665	10	30	3		
67.	Calidris temminckii							72					
68.	Calidris alpina	150	6		314	352			50	61	172	488	40
69.	Calidris minuta/alpina	50											
70.	Calidris canutus								1				
71.	Calidris alba	24				3							

72.	Gallinago gallinago	42	17		16	7	4	5	6	67	41	37	7
73.	Scolopax rusticola												1
74.	Numenius arquata	96			11	11	34	1	16	151	10	60	119
75.	Numenius phaeopus									2			
76.	Limosa limosa				400	614		3	303	62	114	164	39
77.	Limosa lapponica									7			
78.	Charadrii spp.							210					
79.	Larus ichthyaetus	9	22	1	18	6	1			5		25	5
80.	Larus minutus		21	50	7				2				
81.	Larus ridibundus	660		50	10	114	3	53	10	488	130	210	444
82.	Larus genei	1	1	5									
83.	Larus fuscus			1									
84.	Larus cachinnans		3	50	27	933		311	170	491	293	183	456
85.	Larus armenicus								2		7	82	
86.	Larus canus	63	196	50	14	23		12	3		55	46	168
87.	Larus spp.	60						100					
88.	Sterna caspia				1								
89.	Sterna sandvicensis			3									
90.	Anatinae / Fulica atra				11000								
91.	Unidentified waterbirds								34536	21047			2000
	Total number of birds	**142385**	**19091**	**25381**	**69394**	**81693**	**99336**	**23708**	**182456**	**80517**	**52487**	**178376**	**123131**
	Total number of species	**45**	**38**	**40**	**50**	**47**	**43**	**42**	**50**	**55**	**45**	**52**	**47**

3.4.7. Yeşilirmak Delta

The Yeşilırmak Delta is the largest (90.000 ha) delta on the Turkish Black Sea coast. The greater part of the delta has been converted to agriculture. In the eastern part of the delta is the Akgöl and Simenit lake complex, a 1,900 ha area, which 200 ha is open water. The main habitat is reed, swamp, seasonally flooded forest, dunes. There are also smaller lakes like Gagalı, Dumanlı, Akçasaz and Ahubaba.

The delta has lost most of its importance because of intesive human activity and agriculture. Some inland wetlands (including Dipsiz and Kuş lakse) have disappeared.

The results of MWC performed at this site are given in Table 54. During 16 counts 61 waterbird species were observed. The average number of birds per count was 6,091 (R= 455 – 16,220). The average number of species was – 19.4 (R= 5 – 39). The most numerous spescies dirung the period of counting were *Anas platyrhynchos* (A= 2,221; R=0 – 7,750), *Fulica atra* (A=789; R= 0 – 4,467), *Anas crecca* (A= 650; R= 0 – 2,840), *Aythya fuligula* (A= 599; R= 0 – 6,000), *Aythya ferina* (A= 472; R= 0 – 5,400).

The Yeşilırmak Delta have not been counted with the same methodology every year. The changes in the bird numbers counted can be explained partly by variations in the methodology used.

3.4.8. Kizilirmak Delta

The largest and most intact wetland on the Turkish Black Sea coast, the Kızılırmak Delta forms at the point where the 1,182 km long Kızılırmak river flows into the Black Sea. The entire delta covers 56,000 ha, of which 70 % is intensively used by people.

There are seven lakes in the delta, six of them on the east side and one of the on the west side. The lakes in the east are Balık, Uzun, Cernek, Liman, Gıcı and Tatlı lakes and in the west there is Karaboğaz Lake. Most of them are fresh–water except Liman Lake, which has connection with Black Sea.

The Kızılırmak Delta is one of the most studied areas in Turkey. Systematic counts have been made here since 2002. Especially during winter months when most of the inland wetlands freeze, the Kızılırmak Delta is of vital importance as the biggest coastal refuge in the region. It is estimated that over 100,000 waterfowl winter each year in the delta. The MWC results are given in Table 55. During 12 counts 86 waterbird species were observed. The average number of birds per count was 89,830 (R=19,091 – 182,456). The average number of species was – 46.2 (R= 38 – 55). The most numerous species dnring the period of counting were *Fulica atra* (A= 44,033; R= 2,557 – 125,000), *Anas platyrhynchos* (A= 9,946; R= 180 – 50,000), *Anas crecca* (A= 8,343; R= 320 – 30,000), *Aythya ferina* (A= 4,531; R= 547 – 23,877), *Anas clypeata* (A= 2,467; R= 14 – 5,930).

The Kızılırmak Delta has been counted every year from the same spots. The yearly changes in numbers may reflect changes in bird populations or can also be the result of harsh weather conditions as was the case for years 2002 and 2007.

3.4.9. Sinop Coast

The Sinop Coasts is a coastal system of coastal dunes, the Sinop peninsula and the rest of the coastline around Sinop. The northernmost part of Turkey, Inceburun is also located within this area. The main habitats are coastal dunes, reedbeds (in Aksaz), rocky cliffs, deciduous forests.

The MWC results are given in Table 56. During six counts 41 waterbird species were observed. The average number of birds per count was 7,163 (R=1,238 – 27,840). The average number of species was – 20.2 (R= 15 – 29). The most numerous spescies were *Anas platyrhynchos* (A= 1,910; R= 0 – 5,650), *Fulica atra* (A= 476; R= 45 – 816), *Larus cachinnans* (A= 363; R= 64 – 675), *Aythya fuligula* (A= 223; R=12 – 312).

Table 56. Numbers of wintering waterbirds counted on the Sinop Coast

N	Species	1997	2005	2006	2007	2008	2009
1.	Gavia arctica	51		21	105	21	56
2.	Tachybaptus ruficollis	5	3	6			1

3.	Podiceps nigricollis	33	18		3		4
4.	Podiceps grisegena					1	
5.	Podiceps cristatus	155	1	407	35	11	30
6.	Puffinus yelkouan	88	1				
7.	Phalacrocorax carbo	52	14	30	72	5	30
8.	Phalacrocorax aristotelis	43			15	55	1
9.	Phalacrocorax pygmeus		2	2			
10.	Botaurus stellaris			1			
11.	Egretta alba	1	7	2	1	2	2
12.	Egretta garzetta		2		1	1	
13.	Ardea cinerea	1	3	1	2		1
14.	Anser anser			32			
15.	Cygnus olor			11		44	
16.	Cygnus cygnus	5		71			
17.	Tadorna ferruginea			28			
18.	Anas platyrhynchos	85		5206	470	5650	50
19.	Anas crecca			18		25	
20.	Anas penelope			286	1	443	
21.	Anas acuta			36		5	
22.	Netta rufina			4		80	
23.	Aythya ferina	14	2	614	50	110	119
24.	Aythya fuligula	152	289	312	300	12	273
25.	Bucephala clangula			1		8	
26.	Somateria mollissima				2		
27.	Mergus serrator	5		2			
28.	Gallinula chloropus			1			
29.	Fulica atra	45	500	459	230	808	816
30.	Pluvialis squatarola					6	
31.	Pluvialis apricaria			30			
32.	Vanellus vanellus			1		7	
33.	Gallinago gallinago		14	1		4	
34.	Scolopax rusticola			1			
35.	Larus ichthyaetus	1					
36.	Larus melanocephalus	1					
37.	Larus minutus	7					
38.	Larus ridibundus	100		12	15	25	20
39.	Larus cachinnans	675	64	244	186	441	569
40.	Larus armenicus					24	
41.	Larus canus	439	7		670	15	6
42.	Unidentified waterbirds		311	20000			
	Total number of birds	**1958**	**1238**	**27840**	**2158**	**7803**	**1978**
	Total number of species	**21**	**15**	**29**	**17**	**24**	**15**

3.4.10. Sarikum Lake

A complex of dune, lake and forest habitat in a broad valley near the sea. Sarıkum Lake is a shallow brackish coastal lake (184 ha) which is fed by several streams and discharges through a channel into the sea at periods of high water levels. South of the lake and extending several kilometers inland there is an extensive, seasonally flooded forest of *Fraxinus angustifolia*.

The site qualifies as an Important Bird Area for its large numbers of wintering waterfowl (max.20,266) including wintering *Oxyura leucocephala* (max. 55) (Magnin and Yarar, 1997) and *Gavia arctica* (296 individuals) (Eken et al, 2006).

The MWC results are given in Table 57. During 10 counts 47 waterbird species were observed. The average number of birds per count was 3,694 (R= 950 – 8,915). The average number of species was – 22.6 (R= 18 – 31). The most numerous spescies were *Aythya fuligula* (A= 889; R= 0 – 4,523), *Anas platyrhynchos* (A= 827; R= 53 – 3,575), *Aythya ferina* (A= 482; R= 0 – 1,720), *Anas crecca* (A= 474; R= 20 – 2,150), *Fulica atra* (A= 448; R= 20 – 1,740).

Table 57. Numbers of wintering waterbirds counted at Sarıkum Lake

N	Species	1993	1996	1999	2002	2003	2005	2006	2007	2008	2009
1.	Gavia arctica	3	1				22	152			
2.	Tachybaptus ruficollis	4	2	5		10	1	8	16	2	3
3.	Podiceps nigricollis	2	2			7	3	4	4	6	2
4.	Podiceps grisegena	1			12						
5.	Podiceps cristatus	25	35	5		48	16	33		5	6
6.	Phalacrocorax carbo	11	23	3	24	23	2	13	41	8	4
7.	Phalacrocorax pygmeus		4	65				71	5	19	10
8.	Botaurus stellaris	1									
9.	Egretta alba	5	20	7	9	3	3	13	10	7	24
10.	Egretta garzetta		3	1	2	15	1	5	5	2	
11.	Ardea cinerea	3		10	13	22	9	10	7	6	10
12.	Anser anser		57	5	121	17	11	451		11	7
13.	Anser albifrons		185					491			
14.	Cygnus olor	17		1	7			3			7
15.	Cygnus cygnus		3			9		32		10	60
16.	Cygnus columbianus										1
17.	Tadorna ferruginea		1								
18.	Tadorna tadorna				1			2		32	
19.	Anas platyrhynchos	100	53	332	1127	182	796	1343	586	3575	176
20.	Anas crecca	275	210	510	281	20	102	146	970	2150	72
21.	Anas strepera	1	11	11	1		2				2
22.	Anas penelope		290					6	12	180	
23.	Anas acuta	3				25	4	5		6	2
24.	Anas querquedula			150							
25.	Anas clypeata	2	17	14	18	60	24	4	2	2	47
26.	Netta rufina									18	
27.	Aythya ferina	50	266		112	24	68	1291	1120	1720	166
28.	Aythya nyroca			17							

29.	Aythya fuligula	354	4523		597	650	885	528	197	900	258
30.	Bucephala clangula										
31.	Oxyura leucocephala	1	13		9			4		29	8
32.	Mergellus albellus	16	18	12	68	13	65	16	1	2	9
33.	Rallus aquaticus		1						1		2
34.	Gallinula chloropus						1	2			
35.	Fulica atra	1740	79	260	118	20	343	1615	110	125	74
36.	Pluvialis squatarola										
37.	Vanellus vanellus		358	16		1		16	50		
38.	Recurvirostra avosetta									1	
39.	Tringa ochropus								1	1	
40.	Tringa totanus									1	
41.	Calidris alpina									6	
42.	Gallinago gallinago		50				3	3	9	5	
43.	Larus ridibundus					50				50	
44.	Larus cachinnans	20		5	18	50	46	516		34	
45.	Larus armenicus									1	
46.	Larus canus	5					4			1	
47.	Unidentified waterbirds						650				
	Total number of birds	**2639**	**6225**	**1429**	**2538**	**1249**	**3061**	**6783**	**3147**	**8915**	**950**
	Total number of species	**22**	**25**	**19**	**18**	**20**	**22**	**28**	**19**	**31**	**22**

3.4.11. Amasra Coast

The Amasra Coast stretches from Amasra to the Yenice River. There is a small delta, the Filyos Delta, a coastal zone and small islands within the borders of this site. There are several habitat types such as deciduous forests, pseudo shrub and coastal dune.

The MWC results are given in Table 58. During four counts 31 waterbird species were observed. The average number of birds per count was 4,719 (R= 785 – 7,605). The average number of species was – 17.3 (R= 13 – 22). The most numerous spescies were *Podiceps cristatus* (A= 1,890; R= 19 – 4,500), *Larus cachinnans* (A= 954; R= 150 – 2,426), *Larus ridibundus* (A= 953; R= 150 – 3,053), *Phalacrocorax carbo* (A=482; R=105 – 843), *Fulica atra* (A=144; R= 25 – 246).

The Amasra Coast has not been counted with the same methodology every year. The yearly changes in bird numbers counted can be explained partly by variations in methodology.

Table 58. Numbers of wintering waterbirds counted on the Amasra Coast

N	Species	1997	2008	2009	2010
1.	Gavia arctica	8		1	
2.	Tachybaptus ruficollis	2		5	1
3.	Podiceps nigricollis	83		3	4
4.	Podiceps cristatus	180	19	4500	2860
5.	Puffinus yelkouan	56			
6.	Phalacrocorax carbo	843	105	350	630

7.	Phalacrocorax aristotelis	5		2	3
8.	Phalacrocorax pygmeus	2	8	28	16
9.	Botaurus stellaris		6	1	
10.	Egretta alba		24	3	
11.	Egretta garzetta				2
12.	Ardea cinerea		33	6	
13.	Anser albifrons			4	1
14.	Cygnus olor		12		
15.	Cygnus cygnus				5
16.	Anas platyrhynchos	50	6		
17.	Aythya ferina	52	50	3	
18.	Aythya fuligula	126			
19.	Aythya marila			2	
20.	Bucephala clangula			6	2
21.	Mergellus albellus			1	
22.	Rallus aquaticus			1	
23.	Gallinula chloropus				1
24.	Fulica atra	246	220	25	85
25.	Larus ichthyaetus	1		1	
26.	Larus melanocephalus	11			
27.	Larus minutus	7			
28.	Larus ridibundus	3053	150	380	230
29.	Larus cachinnans	2426	150	890	350
30.	Larus canus	454		50	28
31.	Sterna sandvicensis		2	2	2
	Total number of birds	**7605**	**785**	**6264**	**4220**
	Total number of species	**18**	**13**	**22**	**16**

3.4.12. Zonguldak Coast

This is the coastal area of the province Zonguldak. There is inaccessible area on some parts of the coast. The most important areas are Ereğli, Kozlu and Zonguldak port, which are situated on the mouths of the Gülünç and Kozlu rivers respectively. The coastal area lies between the boundaries of Kozlu and the Zonguldak district.

There are very few observations at this site. Ereğli port is important for wintering waterfowl. But there is no systematic count. Only in 2009 was MWC performed at this site (Table 59), during which a total of 1,895 waterbirds of 15 species were observed. The most numerous spescies were *Larus ridibundus* (1,195), *Larus cachinnans* (265) and *Phalacrocorax carbo* (165).

Table 59. Numbers of wintering waterbirds counted at Zonguldak Coast

N	Species	2009
1.	Gavia arctica	6
2.	Podiceps nigricollis	12
3.	Podiceps cristatus	31
4.	Puffinus yelkouan	35
5.	Phalacrocorax carbo	165
6.	Phalacrocorax aristotelis	7
7.	Ardea cinerea	5
8.	Anas platyrhynchos	4
9.	Gallinula chloropus	8
10.	Fulica atra	94
11.	Larus ridibundus	1195
12.	Larus fuscus	2
13.	Larus cachinnans	265
14.	Larus canus	61
15.	Sterna sandvicensis	5
	Total number of birds	**1895**
	Total number of species	**15**

3.4.13. Sakarya Delta

The Sakarya Delta is located in Sakarya district where the Sakarya River flows into the Black Sea. The main habitats are the delta ecosystem, lakes, flooded forests and 40 km of coastal dunes. The inner parts of the delta have Akgöl Lake as the largest freshwater body and Acarlar flooded forest. The delta was drained and irreversibly damaged by drainage for agriculture and urbanization in the last 40 years, resulting in loss of connection between western and eastern parts of the delta. Today the delta can be defined in two parts, Acarlar flooded forest in the western part and Akgöl Lake in the eastern part.

The MWC results are given in Table 60. Outside the timing of MWCs during the winter of 2005 there were 30 – 63 wintering *Branta ruficollis here* and in 2000 there were 17 wintering *Melanitta fusca* recorded (Eken et al, 2006).

During 8 MWC counts 50 waterbird species were observed. The average number of birds per count was 3,216 (R= 102 – 14,004). The average number of species was – 18.3 (R= 5 – 35). The most numerous spescies were *Fulica atra* (A= 1,276; R= 0 – 4,170), *Aythya ferina* (A= 608; R= 0 – 4,569), *Anas platyrhynchos* (A= 297; R= 0 – 1,100), *Anser albifrons* (A= 189; R= 0 – 1,461), *Larus ridibundus* (A= 174; R= 0 – 504).

Table 60. Numbers of wintering waterbirds counted in the Sakarya Delta

N	Species	1968	1969	1990	2005	2006	2007	2008	2010
1.	Gavia arctica								40
2.	Tachybaptus ruficollis				1	45	26	6	
3.	Podiceps nigricollis				15	2		1	6
4.	Podiceps cristatus	1	3	53	160	133	43	339	25

5.	Phalacrocorax carbo			2	58	141	28	53	
6.	Phalacrocorax aristotelis						9		1
7.	Phalacrocorax pygmaeus	20				3	36	32	
8.	Botaurus stellaris	1				2			
9.	Egretta alba			7	3	7	2	1	5
10.	Egretta garzetta			1					
11.	Ardea cinerea			2	6	3	1	1	13
12.	Branta ruficollis					38			
13.	Anser anser	30							
14.	Anser albifrons	50				1461			2
15.	Cygnus olor				2	186		50	7
16.	Cygnus cygnus		4			12			5
17.	Tadorna tadorna					21			
18.	Anas platyrhynchos		200	50		1006		1100	23
19.	Anas crecca			280		8		5	
20.	Anas penelope		4		2	115		3	
21.	Anas acuta					30		8	
22.	Anas querquedula				8				
23.	Anatinae spp.			105			11		
24.	Netta rufina		1		3	38			2
25.	Aythya ferina		20	75	2	4569	6	190	1
26.	Aythya nyroca				2	2			
27.	Aythya fuligula		1			276	7	12	
28.	Aythya marila		7						4
29.	Aythya spp.			215					
30.	Bucephala clangula		1		5	35			3
31.	Somateria mollissima								8
32.	Mergellus albellus				1	168			1
33.	Mergus serrator								2
34.	Rallus aquaticus					1			
35.	Gallinula chloropus				5	15	2		2
36.	Fulica atra		30	20	1065	4170	3820	1101	
37.	Pluvialis squatarola					2			8
38.	Pluvialis apricaria								1
39.	Vanellus vanellus				7	11	36		
40.	Calidris alpina					6			8
41.	Calidris canutus								3
42.	Calidris alba					2			7
43.	Gallinago gallinago			1		1			
44.	Numenius arquata								1
45.	Stercorarius parasiticus			1					
46.	Larus melanocephalus			1					
47.	Larus minutus			88					7

48.	Larus ridibundus			255	504	362	38	159	70
49.	Larus genei					38			1
50.	Larus cachinnans			189	1	159	13	34	150
51.	Larus canus			14		86			245
52.	Larus spp.			280					
53.	Sterna sandvicensis								40
54.	Unidentified waterbirds					850			
	Total number of birds	**102**	**271**	**1639**	**1850**	**14004**	**4078**	**3095**	**691**
	Total number of species	**5**	**10**	**16**	**19**	**35**	**14**	**17**	**30**

3.4.14. Istanbul Coast (Kilyos – Riva – Şile coast)

Kilyos lies in the northernmost part of Istanbul, on the European side of the city. It has a long shore along the water and rocky coast in some parts. Riva lies on the mouth of the Riva stream on the Asian side of the city Istanbul. There is a long sandy shore along the water. Şile lies more to the east than Riva and borders on the south and east the province Kocaeli. Şile is 70 km far from the city of Istanbul. It is a small holiday resort with its great sandy beaches. There is also a complex of four small islands at the entrance of Şile harbour.

Birdwatchers from Istanbul do some birdwatching in this area but these are not systematic studies. Earlier there was no standardized system of recording. Only during MWC in 1997, 2007 and 2009 was the Istanbul Coast counted systematically. The results are given in Table 61.

During the counts 41 waterbird species were observed. The average number of birds per count was 6,902 (R= 1,891 – 15,944). The average number of species was – 24.3 (R= 19 – 32). The most numerous spescies were *Larus cachinnans* (A= 4,318; R= 16 – 11,520), *Fulica atra* (A= 686; R= 67 – 1,426), *Phalacrocorax carbo* (A= 417; R= 44 – 639), *Anas platyrhynchos* (A= 318; R= 0 – 854), *Phalacrocorax aristotelis* (A= 216; R= 0 – 514).

The Istanbul Coast has not been counted with the same methodology every year. The yearly changes in bird numbers counted can be explained partly by variations in the methodology.

Table 61. Numbers of wintering waterbirds counted on the Istanbul Coasts

N	Species	1997	2007	2009
1.	Gavia stellata	1		
2.	Gavia arctica	43		1
3.	Tachybaptus ruficollis	3	31	
4.	Podiceps nigricollis	344	19	29
5.	Podiceps grisegena	1		
6.	Podiceps cristatus	166	43	12
7.	Puffinus yelkouan	492		1
8.	Phalacrocorax carbo	569	44	639
9.	Phalacrocorax aristotelis	135		514
10.	Phalacrocorax pygmeus		32	2
11.	Botaurus stellaris			1
12.	Egretta alba	2	5	6
13.	Ardea cinerea		4	
14.	Branta ruficollis	6		

15.	Cygnus cygnus	1		
16.	Tadorna tadorna	6		
17.	Anas platyrhynchos	854		101
18.	Anas crecca		23	
19.	Anas strepera		6	2
20.	Anas penelope		75	
21.	Aythya ferina	44	87	
22.	Aythya fuligula	159	50	11
23.	Bucephala clangula	39		
24.	Somateria mollissima	3		1
25.	Mergellus albellus		7	
26.	Mergus serrator	31		
27.	Gallinula chloropus			3
28.	Fulica atra	566	1426	67
29.	Pluvialis squatarola	2		12
30.	Tringa totanus	2		
31.	Calidris alba			9
32.	Scolopax rusticola	1		2
33.	Larus ichthyaetus	1		
34.	Larus melanocephalus	63	10	3
35.	Larus minutus	60	7	
36.	Larus ridibundus	294	2	32
37.	Larus genei	1		
38.	Larus fuscus	1		
39.	Larus cachinnans	11520	16	1419
40.	Larus canus	531	4	3
41.	Rissa tridactyla	3		
	Total number of birds	**15944**	**1891**	**2870**
	Total number of species	**32**	**19**	**22**

3.4.15. Bosphorus

The Bosphorus strait is ca 33 km north – south, in most places ca. 1,5 km wide, and separates Europe from Asia. The site is dominated by the city of Istanbul but north of the city there are still largely forested areas.

For the period of counts in the region, this site was counted eight times, during which were observed 31 waterbird species (Table 62). The average number of birds per count was 14,707 (R= 6,257 – 22,644). The average number of species was – 13.3 (R= 7 – 25). The most numerous species dirung the period of counting were *Larus ridibundus* (A= 8,041; R= 97 – 15,040), *Phalacrocorax carbo* (A= 2,686; R= 139 – 9,531), *Larus cachinnans* (A= 2,025; R= 326 – 7,329), *Puffinus yelkouan* (A= 1,093; R=150 – 1,980), *Fulica atra* (A= 340, R = 3 – 875).

Table 62. Numbers of wintering waterbirds counted at the Bosphorus

N	Species	1997	1999	2002	2005	2007	2008	2009	2010
1.	Gavia stellata	1							
2.	Gavia arctica	24							
3.	Tachybaptus ruficollis	3		6					
4.	Podiceps nigricollis	113	7	28	11		4	1	5
5.	Podiceps cristatus	80	19	88			54	93	16
6.	Puffinus yelkouan	207	1377	1517	372	150	1740	1402	1980
7.	Phalacrocorax carbo	139	972	9531	3000	753	3297	1654	2145
8.	Phalacrocorax aristotelis	9	24		384		56	1153	105
9.	Phalacrocorax pygmeus								1
10.	Egretta alba	2							
11.	Ardea cinerea			22		13	9	30	20
12.	Tadorna tadorna	6							
13.	Anas platyrhynchos	301			10				2
14.	Netta rufina								1
15.	Aythya ferina	1		1					
16.	Mergus serrator	14	2						
17.	Fulica atra	3	104	580	180	20	875	301	659
18.	Pluvialis squatarola	2							
19.	Tringa totanus	2							
20.	Calidris alpina							1	
21.	Scolopax rusticola	1							
22.	Larus ichthyaetus	1							
23.	Larus melanocephalus	56	7	13				3	13
24.	Larus minutus	55							
25.	Larus ridibundus	97	15040	9480	1800	6267	14811	6407	10425
26.	Larus fuscus	1	1				2	1	1
27.	Larus cachinnans	7329	2543	1371	500	326	970	615	2543
28.	Larus canus	354	214	3		114	243	187	114
29.	Larus spp.							40	
30.	Rissa tridactyla	2							
31.	Sterna sandvicensis			4			4		12
	Total number of birds	**8803**	**20310**	**22644**	**6257**	**7643**	**22065**	**11888**	**18042**
	Total number of species	**25**	**12**	**13**	**8**	**7**	**12**	**13**	**16**

3.4.16. Terkos Lake

It is 50 kilometers to the north of Istanbul on the Black Sea coast, having an area of 25 km^2 and surrounded by small forests. The main habitats of the area are deciduous forests, heathlands, coastal dunes and freshwater habitats. Terkos Lake was a lagoon until its disconnection from the Black Sea in 1881. In order to supply water to Istanbul the lake was disconnected completely by installing regulators at the point where the lake meets the Black Sea. The lake can approach a length of 14 km and a width of 6 km. The lake is fed by Istıranca, Sivasköy and Çiftlikköy streams so its waters are fresh. It is one of the

Table 63. Numbers of wintering waterbirds counted at Terkos Lake

N	Species	1967	1968	1969	1993	1995	1996	1997	1999	2002	2005	2006	2007	2008	2009	2010
1.	Gavia stellata				2											
2.	Gavia arctica				1			9		1	6			1	1	
3.	Tachybaptus ruficollis			10	41		5		76	39	110	34	57	31	48	29
4.	Podiceps nigricollis			15	5		20		45	17	21	17	41	13	26	32
5.	Podiceps cristatus			30	2119	14	500		110	35	189		64	41	67	41
6.	Puffinus yelkouan												80	100	18	140
7.	Phalacrocorax carbo				90	5	45		60	49	189	91	399	30	502	240
8.	Phalacrocorax aristotelis													1		2
9.	Phalacrocorax pygmeus				12				56	224	50	4	47	44	21	18
10.	Botaurus stellaris								2						1	2
11.	Egretta alba				10		40		9	3	11	11	15	74	27	2
12.	Ardea cinerea					1			11	2	59	9	6	4	14	4
13.	Platalea leucorodia												4			
14.	Ciconia ciconia									1						
15.	Branta ruficollis							6								
16.	Anser anser								1	2						
17.	Anser albifrons				1							19				
18.	Cygnus olor							1	39	102		126		5	1	
19.	Cygnus cygnus			4												
20.	Tadorna tadorna	2	1				1				63			1		
21.	Anas platyrhynchos	86	400	15		200	2440		3	2000	135	2379	270	2	2104	14
22.	Anas crecca	2									6	57	24		12	30
23.	Anas strepera											5	6			
24.	Anas penelope										104	160	75	22	20	
25.	Anas acuta	45	200								1	60	2		1	

26.	Anas querquedula	1	1													
27.	Anas clypeata	1	45						1							
28.	Netta rufina				2											
29.	Aythya ferina	1		5	117	7700	200		759	604	14	2468	89	109	113	24
30.	Aythya nyroca					5										
31.	Aythya fuligula	46	50	50	1538	15	300		602	296	160	257	276	14	79	28
32.	Aythya marila											2				
33.	Bucephala clangula									60		9				2
34.	Melanitta fusca									1						
35.	Mergellus albellus			6					9	7	26	39	20	3		10
36.	Mergus serrator			3				13		23				3		2
37.	Mergus merganser											1				
38.	Rallus aquaticus				1											
39.	Gallinula chloropus								12	1	3	1				2
40.	Fulica atra			2000	3890	1735	500		6561	2936	8101	3470	2014	3130	5257	2389
41.	Pluvialis apricaria								2							
42.	Vanellus vanellus												170	8	300	
43.	Tringa nebularia													1		
44.	Philomachus pugnax								1							
45.	Calidris alpina								2		5					
46.	Calidris canutus								1							
47.	Gallinago gallinago				2		1		4		5			1		
48.	Scolopax rusticola						1				6					
49.	Numenius arquata													2		16
50.	Larus ichthyaetus											8				
51.	Larus melanocephalus				1							1	10	3	1	5
52.	Larus minutus				12		1		14		29		7			
53.	Larus ridibundus				2		30		15	40	154	7	2	76	510	339
54.	Larus genei														1	

55.	Larus cachinnans				2		10	230	34	77	22	250	16	110	118	198
56.	Larus canus				17			16	11	1	44		4	3		19
57.	Sterna sandvicensis													7		
58.	Unidentified waterbirds			5000		200						1500	3125			57
	Total number of birds	**184**	**697**	**7138**	**7865**	**9875**	**4094**	**275**	**8440**	**6521**	**9513**	**10985**	**6823**	**3839**	**9242**	**3645**
	Total number of species	**8**	**6**	**10**	**20**	**8**	**15**	**6**	**26**	**23**	**25**	**25**	**24**	**28**	**23**	**24**

main fresh water sources of Istanbul.

The sources for bird records are from Mid Winter Counts (MWC) and KusBank (the internet based Turkish Bird Database). Bird species and numbers based on MWC are given in Table 63.

For the period of counts in the region, this site was counted 15 times, during which were observed 57 waterbird species. The average number of birds per count was 5,942 (R=184 – 10,985). The average number of species was – 18.1 (R= 6 – 28). The most numerous species dirung the period of counting were *Fulica atra* (A= 2,799; R=0 – 8,101), *Aythya ferina* (A= 814; R= 0 – 7,700), *Anas platyrhynchos* (A= 670; R= 0 – 2440), *Aythya fuligula* (A= 247; R= 0 – 1,538), *Podiceps cristatus* (A= 214; R= 0 –2,119).

3.4.17. Iğneada

A complex of seasonally flooded forests, swamps, freshwater lakes and sand dune habitat on the Black Sea coast near the Turkish – Bulgarian border. Water from the mountains flows via a number of streams to the sea (the most prominent being the Çavuşdere) and accumulates behind the dunes where it feeds the flooded forests which are largely below sea level. Five small lakes with a rich and diverse aquatic flora are situated within the area. The northernmost, Erikli (43 ha), is a coastal lagoon with no outlet to the sea during summer. The southernmost, Saka Lake (5 ha) is a freshwater lake located immediately inland from the sand dunes. Mert Lake (266 ha) is in fact a small delta of the Çavuşdere stream. Hamam Lake (19 ha) and Pedina Lake (10 ha) are situated further inland (Magnin and Yarar, 1997).

The sources for bird records are from Mid Winter Counts (MWC) and KusBank (the internet based Turkish Bird Database). KusBank records may not reflect systematic counts. Visits by the birdwatchers may not cover all the area and so the data are not suitable for elaborating yearly changes in numbers and species. Therefore only MWC records are used to analyze yearly changes. Bird and species numbers based on MWC are given in Table 64.

For the period of counts in the region, this site was counted seven times, during which 56 waterbird species were observed. The average number of birds per count was 2,967 (R=622 – 7,631). The average number of species was – 24.3 (R= 10 – 36). The most numerous spescies dirung the period of counting were *Fulica atra* (A= 1,737; R= 12 – 5,950), *Aythya ferina* (A= 489; R=0 – 1,090), *Anas platyrhynchos* (A= 274; R= 0 – 1,476).

A yearly comparison appears to show an increase over previous years in 2008 and then in 2009 and 2010 the numbers decrease but not to the level of the years before 2008. There is no information about the precise extent of the areas censused. There is limited access to the biggest lake (Mert Lake) and many observers do not reach this area, as was the case in the 2009 and 2010 counts. The drastic changes in numbers may thus be due to the variations in the areas counted.

Table 64. Numbers of wintering waterbirds counted at İğneada

N	Species	1992	1994	1997	2007	2008	2009	2010
1.	Gavia stellata							1
2.	Gavia arctica		17	46			5	3
3.	Tachybaptus ruficollis	2	8		19	6	36	10
4.	Podiceps nigricollis	7	1	202	27	55	42	62
5.	Podiceps grisegena			5				
6.	Podiceps cristatus	6	4	30	7	7	14	21
7.	Puffinus yelkouan			14				
8.	Pelecanus onocrotalus						1	
9.	Phalacrocorax carbo		35	10	41	38	142	61
10.	Phalacrocorax aristotelis			11				
11.	Phalacrocorax pygmeus	14				6	4	5
12.	Botaurus stellaris		1				1	2

13.	Egretta alba	2	5	2	9	2	7	7
14.	Egretta garzetta	2						
15.	Ardea cinerea	2	6	1	2	4	6	6
16.	Anser anser					4		17
17.	Anser albifrons			8				1
18.	Cygnus olor	136	88	10		35	37	11
19.	Cygnus cygnus		24	1			23	1
20.	Cygnus columbianus						3	
21.	Tadorna tadorna				3			
22.	Anas platyrhynchos		21	25	37		356	1476
23.	Anas crecca						4	75
24.	Anas strepera					7		
25.	Anas penelope		1	2	7	5		1
26.	Anas acuta		2			4		4
27.	Anas clypeata						7	
28.	Netta rufina			1		8	3	
29.	Aythya ferina	1	609	61		1010	1090	655
30.	Aythya nyroca						1	5
31.	Aythya fuligula		50	15	1	211	40	74
32.	Aythya marila						3	
33.	Clangula hyemalis					1		
34.	Bucephala clangula		1			6	9	12
35.	Melanitta nigra			2				
36.	Mergellus albellus				5		36	13
37.	Mergus serrator			12			7	7
38.	Rallus aquaticus						2	
39.	Gallinula chloropus			1			1	1
40.	Fulica atra	450	12	1081	1037	5950	2732	895
41.	Pluvialis squatarola		2		1		6	
42.	Charadrius hiaticula							1
43.	Haematopus ostralegus					1		
44.	Tringa ochropus					7	1	
45.	Tringa nebularia						1	
46.	Calidris alpina				6	5	4	
47.	Calidris alba			5				2
48.	Gallinago gallinago		2				4	
49.	Numenius arquata			1		1		
50.	Larus melanocephalus			5	1	3	3	22
51.	Larus minutus			4				
52.	Larus ridibundus			7	6	200	145	55
53.	Larus genei					1		
54.	Larus cachinnans			85	82	50	35	280
55.	Larus canus			5		2	29	55

56.	Sterna sandvicensis					2		
	Total number of birds	**622**	**889**	**1652**	**1291**	**7631**	**4840**	**3841**
	Total number of species	**10**	**19**	**28**	**17**	**28**	**36**	**32**

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4. Conclusions on current status of IWC and generalized results of winter waterbird counts at Black Sea Coast of Ukraine, Georgia and Turkey

Kostiushyn V.

4.1. Current status of IWC methodological framework and infrastructure

Based on national reports from Ukraine, Georgia and Turkey this part of the book provides a brief overview of the current status of IWC in all three countries and the requirements for its further development. Counts of wintering waterbirds have a long history in all countries: in Ukraine – from the 1920s (but more or less regular only from 1991), in Turkey from 1967 and in Georgia from 1989.

Despite the long period of wintering waterbird counts in these countries, a methodological basis for this is still insufficiently developed. Turkey uses for this purpose the methodology of the Midwinter Waterfowl Count, which is the only basis for IWC in the country. Ukraine uses IWC methodology, but still only partly. For example, until now in the country there has been no final delimitation of count wetlands for large wetlands or their constituent parts. A similar situation prevails in Georgia.

Counts in all three countries do not take place on a regular basis and don't cover the same set of key sites each year.

The quality of reporting on counts, at least for Ukraine, still suffers from certain inadequacies. The data submitted is often combined from several wetlands or the constituent parts of big wetlands instead of information for each site being submitted separately. Only a few years ago was the practice of using of count coverage maps begun, which is a very important improvement. In former times, information on site coverage was, more often than not, omitted from reports.

In some cases counts have been conducted outside the time frame recommended by IWC methodology. For example, in earlier times, in Georgia a comparatively large proportion of counts was conducted in February instead of January.

The absence of clear borders to count sites, a lack of information on site coverage during each count and the submission of combined data for several sites or data for overlapping areas makes it much more difficult, or in some cases even impossible, to perform a proper analysis of the information collected. This is especially problematic for evaluation of importance and current status of separate wetlands, many of which are Ramsar sites or protected areas under national legislation.

In each country counts are coordinated by local conservation NGOs or scientific organizations: Doğa Derneği in Turkey, the Georgian Centre for Conservation of Wildlife in Georgia and the Azov-Black Sea Ornithological Station in Ukraine. In Ukraine the coordination mechanism has two levels – the national coordinator and regional coordinators, each responsible for a certain region.

The network of counters – professional ornithologists and volunteers - is the most crucial factor for high-quality bird counts. In all three countries such networks exist, but they need considerably more development and support.

Beside accumulation of count data in the IWC data base of Wetlands International, Turkey and Ukraine have their own data bases, though a separate database for Georgia is absent.

All three countries suffer from a serious lack of equipment and there is a need for much more financial support for conducting field work. This is especially important for countries with a long coast line and large wetlands. Winter counts in regions without good roads and deep snow require suitable all-terrain vehicles and a sufficient volume of petrol.

Thus, for further improvement of IWC in Ukraine, Georgia and Turkey resolution of the following points is a necessity:

– finalizing delimitation of all count sites and agreeing borders with local ornithologists/ birdwatchers, which is important for precision and quality of field work;

– producing maps of count sites in GIS format or/and in Google Earth formats (kmz or kml), and making them accessible through the Internet. For participants of counts who have no or limited access to the Internet it is necessary to publish these maps;

– standardizing as much as posible the methodology of counts at each count site (using from year to

year the same count routes and observation points);

– producing simple count coverage maps for each count of each site;

– inclusion in count reports of "zero data", when a site was counted but birds for some reasons were absent;

– conducting of winter counts of waterbirds only within the period recommended by IWC methodology;

– avoidance of collecting and accumulating combined data from several sites or overlapping areas;

– development of national data bases for accumulation of count results and aiming at comparability in this with IWC data base located in Wetlands International;

– to stimulate participation of professional ornithologists and birdwatchers in counts, annually print results of winter counts in a brochure format (like ROM-bulletin in Ukraine) and also make them available via the Internet;

– regularly (preferably annually) conduct national meetings for network of counters;

– regulary conduct training sessions in waterbird counts for beginners;

– support counters as much as possible with necessary equipment and funding for their completed work.

4.2. Overall results of wintering waterbirds counts in Ukraine, Georgia and Turkey

In total during the given period in the coastal wetlands of all three countries 8,715,072 wintering waterbirds were counted: in Ukraine - 6,168,878, in Georgia – 876,122 and in Turkey – 1,670,072 (incl. 90,722 unidentified waterbirds). Detailed information is in Table 65.

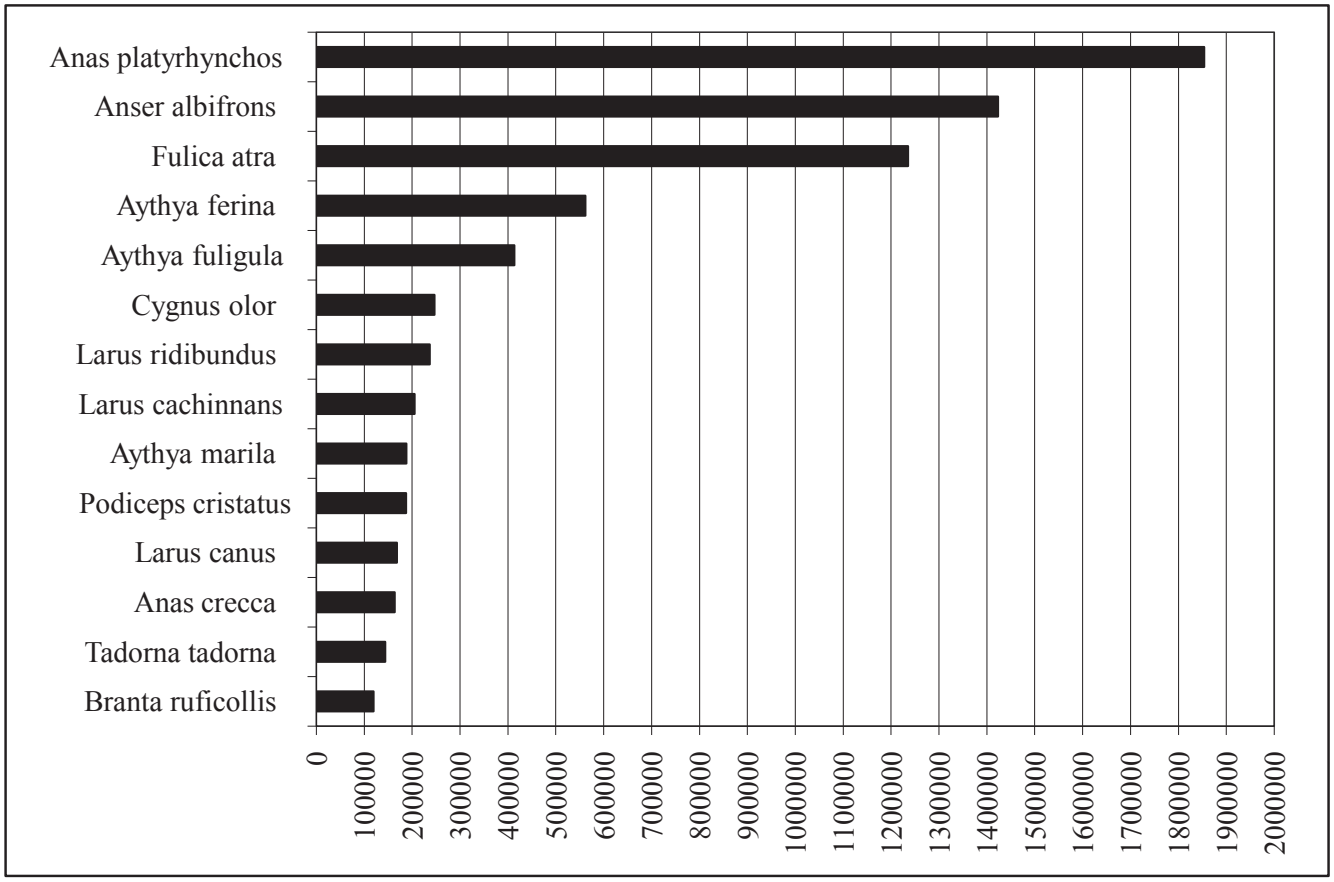
Table 65. The total numbers of wintering water birds counted at coastal wetlands of Ukraine, Georgia and Turkey

Order	Family	Species name	Total	%
Gaviiformes	Gaviidae	Gavia stellata	103	<0,01
Gaviiformes	Gaviidae	Gavia arctica	5175	0,06
Gaviiformes	Gaviidae	Gavia spp.	321	<0,01
		Sub–total	***5599***	***0,06***
Podicipediformes	Podicipedidae	Tachybaptus ruficollis	6756	0,08
Podicipediformes	Podicipedidae	Podiceps nigricollis	7740	0,09
Podicipediformes	Podicipedidae	Podiceps auritus	46	<0,01
Podicipediformes	Podicipedidae	Podiceps grisegena	353	<0,01
Podicipediformes	Podicipedidae	Podiceps cristatus	187483	2,15
Podicipediformes	Podicipedidae	P.nigricollis/cristatus	20060	0,23
Podicipediformes	Podicipedidae	Podicipedidae spp.	452	0,01
		Sub–total	***222890***	***2,56***
Procellariiformes	Procellariidae	Puffinus yelkouan	11071	0,13
Procellariiformes	Procellariidae	Puffinus puffinus	12	<0,01
		Sub-total	***11083***	***0,13***
Pelecaniformes	Pelecanidae	Pelecanus onocrotalus	10	<0,01
Pelecaniformes	Pelecanidae	Pelecanus crispus	243	<0,01
Pelecaniformes	Pelecanidae	Pelecanus spp.	9	<0,01
Pelecaniformes	Phalacrocoracidae	Phalacrocorax carbo	69737	0,80
Pelecaniformes	Phalacrocoracidae	Phalacrocorax aristotelis	3707	0,04
Pelecaniformes	Phalacrocoracidae	Phalacrocorax pygmaeus	13170	0,15
Pelecaniformes	Phalacrocoracidae	Phalacrocorax spp.	2	<0,01
		Sub–total	***86878***	***1,00***

Ciconiiformes	Ardeidae	Botaurus stellaris	215	<0,01
Ciconiiformes	Ardeidae	Nycticorax nycticorax	24	<0,01
Ciconiiformes	Ardeidae	Bubulcus ibis	4	<0,01
Ciconiiformes	Ardeidae	Egretta alba	3333	0,04
Ciconiiformes	Ardeidae	Egretta garzetta	1288	0,02
Ciconiiformes	Ardeidae	Egretta/Bubulcus spp.	6	<0,01
Ciconiiformes	Ardeidae	Ardea cinerea	2473	0,03
Ciconiiformes	Ardeidae	Ardea purpurea	2	<0,01
Ciconiiformes	Threskiornithidae	Platalea leucorodia	4	<0,01
Ciconiiformes	Threskiornithidae	Plegadis falcinellus	65	<0,01
Ciconiiformes	Ciconiidae	Ciconia ciconia	4	<0,01
Ciconiiformes	Ciconiidae	Ciconia nigra	19	<0,01
		Sub–total	***7437***	***0,09***
Phoenicopteriformes	Phoenicopteridae	Phoenicopterus roseus	6	<0,01
		Sub–total	***6***	***<0,01***
Anseriformes	Anatidae	Branta leucopsis	14	<0,01
Anseriformes	Anatidae	Branta ruficollis	119404	1,37
Anseriformes	Anatidae	Anser anser	57520	0,66
Anseriformes	Anatidae	Anser albifrons	1423516	16,33
Anseriformes	Anatidae	Anser erythropus	1451	0,02
Anseriformes	Anatidae	Anser fabalis	369	<0,01
Anseriformes	Anatidae	Anser caerulescens	9	<0,01
Anseriformes	Anatidae	Anser spp.	4376	0,05
Anseriformes	Anatidae	Cygnus olor	246750	2,83
Anseriformes	Anatidae	Cygnus cygnus	23279	0,27
Anseriformes	Anatidae	Cygnus columbianus	252	<0,01
Anseriformes	Anatidae	Cygnus spp.	35015	0,40
Anseriformes	Anatidae	Tadorna ferruginea	2220	0,03
Anseriformes	Anatidae	Tadorna tadorna	143946	1,65
Anseriformes	Anatidae	Anas platyrhynchos	1853459	21,27
Anseriformes	Anatidae	Prob.>99% Anas platyrhynchos	5500	0,06
Anseriformes	Anatidae	Anas crecca	163401	1,88
Anseriformes	Anatidae	Anas strepera	5824	0,07
Anseriformes	Anatidae	Anas penelope	68960	0,79
Anseriformes	Anatidae	Anas acuta	21826	0,25
Anseriformes	Anatidae	Anas querquedula	2679	0,03
Anseriformes	Anatidae	Anas clypeata	31409	0,36
Anseriformes	Anatidae	Anas spp.	46405	0,53
Anseriformes	Anatidae	Anatinae spp.	413506	4,75
Anseriformes	Anatidae	Anas, Aythya – mixed	3520	0,04
Anseriformes	Anatidae	Netta rufina	26208	0,30
Anseriformes	Anatidae	Aythya ferina	561914	6,45

Anseriformes	Anatidae	Aythya nyroca	3450	0,04
Anseriformes	Anatidae	Aythya fuligula	413447	4,74
Anseriformes	Anatidae	Aythya marila	187805	2,16
Anseriformes	Anatidae	Aythya spp.	173413	1,99
Anseriformes	Anatidae	Clangula hyemalis	580	0,01
Anseriformes	Anatidae	Bucephala clangula	59018	0,68
Anseriformes	Anatidae	Somateria mollissima	2796	0,03
Anseriformes	Anatidae	Melanitta nigra	405	<0,01
Anseriformes	Anatidae	Melanitta fusca	865	0,01
Anseriformes	Anatidae	Oxyura leucocephala	1480	0,02
Anseriformes	Anatidae	Mergellus albellus	43425	0,50
Anseriformes	Anatidae	Mergus serrator	7964	0,09
Anseriformes	Anatidae	Mergus merganser	7635	0,09
		Sub–total	***6165015***	***70,74***
Gruiformes	Gruidae	Grus grus	68	<0,01
Gruiformes	Rallidae	Rallus aquaticus	603	0,01
Gruiformes	Rallidae	Porzana porzana	4	<0,01
Gruiformes	Rallidae	Porzana parva	22	<0,01
Gruiformes	Rallidae	Gallinula chloropus	1995	0,02
Gruiformes	Rallidae	Porphyrio porphyrio	2784	0,03
Gruiformes	Rallidae	Fulica atra	1235495	14,18
		Sub–total	***1240971***	***14,24***
		Anatinae / Fulica atra	11281	0,13
		Sub–total	***11281***	***0,13***
Charadriiformes	Charadriidae	Pluvialis squatarola	666	0,01
Charadriiformes	Charadriidae	Pluvialis apricaria	5316	0,06
Charadriiformes	Charadriidae	Charadrius hiaticula	44	<0,01
Charadriiformes	Charadriidae	Charadrius dubius	9	<0,01
Charadriiformes	Charadriidae	Charadrius alexandrinus	28	<0,01
Charadriiformes	Charadriidae	Vanellus vanellus	22599	0,26
Charadriiformes	Charadriidae	Vanellus leucurus	1	<0,01
Charadriiformes	Charadriidae	Arenaria interpres	3	<0,01
Charadriiformes	Charadriidae	Himantopus himantopus	3	<0,01
Charadriiformes	Charadriidae	Recurvirostra avosetta	26	<0,01
Charadriiformes	Haematopidae	Haematopus ostralegus	49	<0,01
Charadriiformes	Scolopacidae	Tringa ochropus	90	<0,01
Charadriiformes	Scolopacidae	Tringa nebularia	61	<0,01
Charadriiformes	Scolopacidae	Tringa totanus	909	0,01
Charadriiformes	Scolopacidae	Tringa erythropus	67	<0,01
Charadriiformes	Scolopacidae	Tringa stagnatilis	2	<0,01
Charadriiformes	Scolopacidae	Tringa spp.	105	<0,01
Charadriiformes	Scolopacidae	Actitis hypoleucos	10	<0,01
Charadriiformes	Scolopacidae	Philomachus pugnax	34	<0,01

Charadriiformes	Scolopacidae	Calidris minuta	1889	0,02
Charadriiformes	Scolopacidae	Calidris temminckii	72	<0,01
Charadriiformes	Scolopacidae	Calidris alpina	6952	0,08
Charadriiformes	Scolopacidae	Calidris minuta/alpina	50	<0,01
Charadriiformes	Scolopacidae	Calidris canutus	227	<0,01
Charadriiformes	Scolopacidae	Calidris alba	342	<0,01
Charadriiformes	Scolopacidae	Calidris spp.	616	0,01
Charadriiformes	Scolopacidae	Lymnocryptes minimus	4	<0,01
Charadriiformes	Scolopacidae	Gallinago gallinago	450	<0,01
Charadriiformes	Scolopacidae	Scolopax rusticola	20	<0,01
Charadriiformes	Scolopacidae	Numenius arquata	1807	0,02
Charadriiformes	Scolopacidae	Numenius phaeopus	6	<0,01
Charadriiformes	Scolopacidae	Numenius spp.	51	<0,01
Charadriiformes	Scolopacidae	Limosa limosa	1702	0,02
Charadriiformes	Scolopacidae	Limosa lapponica	7	<0,01
Charadriiformes		Charadrii spp.	24	<0,01
Charadriiformes	Stercorariidae	Stercorarius pomarinus	42	<0,01
Charadriiformes	Stercorariidae	Stercorarius parasiticus	30	<0,01
Charadriiformes	Stercorariidae	Stercoranius spp.	26	<0,01
Charadriiformes	Laridae	Larus ichthyaetus	4269	0,05
Charadriiformes	Laridae	Larus melanocephalus	557	0,01
Charadriiformes	Laridae	Larus minutus	10350	0,12
Charadriiformes	Laridae	Larus ridibundus	236941	2,72
Charadriiformes	Laridae	Prob.>99% Larus ridibundus	73900	0,85
Charadriiformes	Laridae	Larus genei	1018	0,01
Charadriiformes	Laridae	Larus fuscus	169	<0,01
Charadriiformes	Laridae	Larus argentatus	87	<0,01
Charadriiformes	Laridae	Larus cachinnans	204874	2,35
Charadriiformes	Laridae	Larus michahellis	69566	0,80
Charadriiformes	Laridae	Larus michahellis/ cachinnans	6670	0,08
Charadriiformes	Laridae	Larus armenicus	266	<0,01
Charadriiformes	Laridae	Larus michah/cachin/ armen.	17775	0,20
Charadriiformes	Laridae	Larus canus	167980	1,93
Charadriiformes	Laridae	Larus spp.	33896	0,39
Charadriiformes	Laridae	Rissa tridactyla	5	<0,01
Charadriiformes	Laridae	Sterna caspia	1	<0,01
Charadriiformes	Laridae	Sterna sandvicensis	307	<0,01
Charadriiformes	Laridae	Sterna spp.	10	<0,01
		Sub–total	***873190***	***10,02***
		Unidentified waterbirds	**90722**	**1,04**
		TOTAL	**8254269**	**100,00**



Pic.12 The most common wintering waterbirds in coastal wetlands of 3 countries

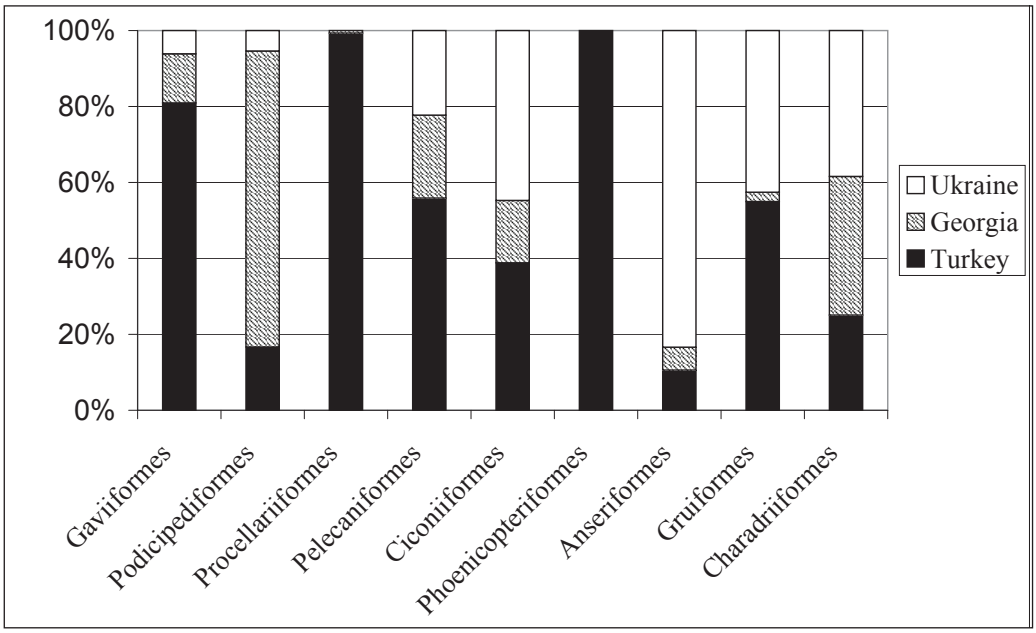
According to collected data the most common species were *Anas platyrhynchos* (1,853,459), *Anser albifrons* (1,423,516), *Fulica atra* (1,235,495), *Aythya ferina* (561,914), *Aythya fuligula* (413,447), *Cygnus olor* (246,750), *Larus ridibundus* (236,941), *Larus cachinnans* (204,874), *Aythya marila* (187,805), *Podiceps cristatus* (187,483), *Larus canus* (167,980), *Anas crecca* (163,401), *Tadorna tadorna* (143,946) and *Branta ruficollis* (119,404). The first three species altogether come to 51,8 % of the total amount of counted waterbirds (Pic.12). The distribution of each of these species among count sites is presented in color pictures 14 – 28.

It is necessary to note that *Aythya marila* usually is not a numerous species and is included in the list above only because 80,000 birds were counted at Eastern Sivash in 1991. Since this data was submitted in a combined count report for whole of Eastern Sivash, it was used only for the general report for Ukraine but not for reporting on key sites – Northern part of Eastern Sivash and Southern part of Eastern Sivash. Due to this it was also not put on Pic.24 devoted to distribution of this species among count sites.

The percentages of the different taxonomic groups of wintering waterbirds were different in Ukraine, Georgia and Turkey. About 84,3% of waterbirds counted in Ukraine are Anseriformes, in second place are Gruiformes – 9,3% and at third – Charadriiformes – 5,9%. In Georgia Anseriformes also dominated, but their percentage was only 40,1%. In second and third places were Charadriiformes (34,5%) and Podicipediformes (19,8%). In Turkey the most common groups were Gruiformes (38,4%), Anseriformes (36,9%) and Charadriiformes (12,4%).

The ratios of taxonomic groups in the total number of counted waterbirds in all three countries are presented in Pic.13. According to this, Gaviiformes, Procellariiformes, Pelicaniformes, Phoenicopteriformes and Gruiformes winter chiefly along the Turkish coast, Podicipediformes – on the Georgian coast, Anseriformes – on the Ukrainian coast, Charadriiformes – are more numerous in Ukraine and Georgia.

The number of birds per key coastal wetlands of Ukraine, Georgia and Turkey is presented in table 66. Sivash is the most important among them and can host more than 0,6 million birds at one time. Even split up into 5 areas suitable for counts, some of its parts still support the largest amount of waterbirds in the region, for example – Southern part of Eastern Sivash (292,922). Among other important wetlands it is



Pic.13 Ratios of taxonomic groups of waterbirds wintering in Ukraine, Georgia and Turkey

worth mentioning the Kizilirmak Delta (182,456), Shagany, Alibei & Burnas Limans (84,677), the Black Sea coast: Batumi - Kobuleti (81,971), Katlabukh, Safiany and Kitai Lakes (76,536), the Dniester Liman (63,020), the Molochnyi Liman (60,414), Tendrovskii Bay (57,749), the Tiligulskii Liman (55,536), the Danube Delta (40,656).

Table 66. Number of waterbirds per site

N	Country	Site name	Number of birds	
			Average	Maximum
1	Ukraine	Kagul, Kugurlui &Yalpug Lakes	5276	14780
2	Ukraine	Katlabukh, Safiany & Kitai Lakes	27002	76536
3	Ukraine	Danube Delta	22182	40656
4	Ukraine	Stentsovsko–Zhebrianovskie Plavni	20430	46648
5	Ukraine	Sasyk Liman	18521	39171
6	Ukraine	Shagany, Alibei & Burnas Limans	36501	84677
7	Ukraine	Budakskii & Gribovskii Limans	9550	26540
8	Ukraine	Dniester Liman	13657	63020
9	Ukraine	Dniester Delta & Kuchurganskii Liman	6929	13346
10	Ukraine	Sukhoi Liman	5201	10222
11	Ukraine	Khadzibeiskii Liman	2425	8814
12	Ukraine	Odessa Bay	5906	26857
13	Ukraine	Kuyalnitskii Liman	1857	5000
14	Ukraine	Adzhalykskii Limans	9617	26470
15	Ukraine	Tiligulskii Liman	6873	55536
16	Ukraine	Berezanskii Liman	2878	5400
17	Ukraine	Dniepro–Bugskii Liman	4107	17220
18	Ukraine	Yagorlytskii Bay	9762	20552
19	Ukraine	Tendrovskii Bay	26719	57749

20	Ukraine	Dzharylgachskii Bay	10134	28767
21	Ukraine	Sevastopol Bays	18472	32085
22	Ukraine	Southern part of Eastern Sivash	86417	292922
23	Ukraine	Northern part of Eastern Sivash	68929	246707
24	Ukraine	Southern part of Central Sivash	27451	55228
25	Ukraine	Northern part of Central Sivash	34138	107717
26	Ukraine	Western Sivash	43639	201552
27	Ukraine	Utlukskii & Sivashik Limans	23743	49561
28	Ukraine	Molochnyi Liman	16544	60414
29	Georgia	Churia Marshes	323	324
30	Georgia	Black Sea coast within Kolkheti National Park	26692	36217
31	Georgia	Partotskali Lake	4586	9078
32	Georgia	Rioni River Delta	17298	29850
33	Georgia	Paliastomi Lake	27181	45465
34	Georgia	Peat Cuttings (South of Paliastomi)	1047	1814
35	Georgia	Khidmaghala Fishponds	392	510
36	Georgia	Ispani Marshes	700	700
37	Georgia	Chorokhi River Delta	9836	12822
38	Georgia	Black Sea coast outside Kolkheti National Park	27754	53245
39	Georgia	Black Sea coast: Sarpi – Chorokhi	8183	8183
40	Georgia	Black Sea coast: Makhinjauri – Kobuleti	5054	5054
41	Georgia	Black Sea coast: Kobuleti – River Choloki	2401	2401
42	Georgia	Black Sea coast: Batumi – Kobuleti	81971	81971
43	Georgia	Black Sea coast: Kobuleti – Ureki	16851	16851
44	Georgia	Black Sea coast: Ureki – Poti	17116	17116
45	Turkey	Artvin Coast	2996	4203
46	Turkey	Rize Coast	2996	4203
47	Turkey	Trabzon Coast	8457	9672
48	Turkey	Giresun Coast	13931	23336
49	Turkey	Ordu Coast	17061	17061
50	Turkey	Samsun Coast	2130	4138
51	Turkey	Yeşilırmak Delta	6091	16220
52	Turkey	Kizilirmak Delta	89830	182456
53	Turkey	Sinop Coast	7163	27840
54	Turkey	Sarikum Lake	3694	8915
55	Turkey	Amasra Coast	4719	7605
56	Turkey	Zonguldak Coast	1895	1895
57	Turkey	Sakarya Delta	3216	14004
58	Turkey	Istanbul Coast	6902	15944
59	Turkey	Bosphorus	14707	22644
60	Turkey	Terkos Lake	5942	10985
61	Turkey	Igneada	2967	7631

Annex 1. List of waterbird count participants and their contact details

Name	Title	E–Mail	Survey Area
Ivan Rusev	Mechnikov Research Antiplague Institute, Bird Researcher	rusevivan@ukr.net	Western Pridunavie, Eastern Pridunavie, Danube Wetlands, Tuzlovskie Limans, Dniester Wetlands, Odessa Limans, Tiligulskii and Berezanskii limans
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Vladimir Stoilovskii	Mechnikov University of Odessa, Bird Researcher	stoylovs@tm.odessa.ua	
Dmitrii Kivganov	Mechnikov University of Odessa, Bird Researcher	sterna@tm.odessa.ua	
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Oleg Formanyuk	Birdwatcher	bird–see@rambler.ru	
Pavel Panchenko	Birdwatcher	panps@ukr.net	
Zinovii Petrovich	Regional Landscape Park “Kinburnskaya Kosa”, Director	borisfenida@och.mk.ua	Dnieper–Bugskie Wetlands, Tendrovsko–Yagorlytskie Wetlands, Dzharylgachskii Bay, Karkinitskiy Bay, Western Sivash
Konstantin Redinov	Regional Landscape Park “Kinburnskaya Kosa”, Bird Researcher	borisfenida@och.mk.ua	
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Grigorii Zatsarnyi	Black Sea Biosphere Reserve, Bird Researcher		
Tatiana Ardamatskaya	Black Sea Biosphere Reserve, Bird Researcher		
Victor Gavrilenko	Biosphere Reserve “Askania–Nova”, Director	askania–zap@mail.ru	
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Mikhail Listopadskii	Biosphere Reserve “Askania–Nova”, Bird Researcher	ekobirds@ukr.net	
Denis Oleinik	Birdwatcher	den–falco@ukr.net	

Mikhail Beskaravainyi	Karadag Nature Reserve, Bird Researcher	karadag@crimea.com\2C mbesk@pochta.ru	Tarkhankut Wetlands, Western coast of Crimea, Southern coast of Crimea, Crimean Mountain Wetlands, Crimean Plain Wetlands, Kerch peninsula
Sergei Kostin	Nikitskii Botanical Garden, Scientific Researcher	serj_kostin@mail.ru	
Boris Appak	Crimean Nature Reserve, Bird Researcher		
Vladmir Kucherenko	Crimea State Plague Control Station, Bird Researcher	v.kuch@mail.ru	
Vladmir Chirniy	Crimea State Plague Control Station, Bird Researcher	plaguestat@ardinvest.net	
Sergei Prokopenko	Birdwatcher		
Yuriy Andryushchenko	National coordinator, Azov–Black Sea Ornithological Station Station, Bird Researcher	anthropoides@mail.ru	Central Sivash, Eastern Sivash, Utlyukskie Wetlands, Molochanskiye Wetlands
Josef Chernichko	Azov–Black Sea Ornithological Station, Bird Researcher	j.chernichko@gmail.com	
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Vladimir Kinda	Birdwatcher		
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Vasiliy Kostiushyn	Wetlands International Black Sea programme coordinator, Institute of Zoology NASU	kost@izan.kiev.ua	
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Alexandr Bronskov	National Nature Park “Meotida”	bronskov@mail.ru	

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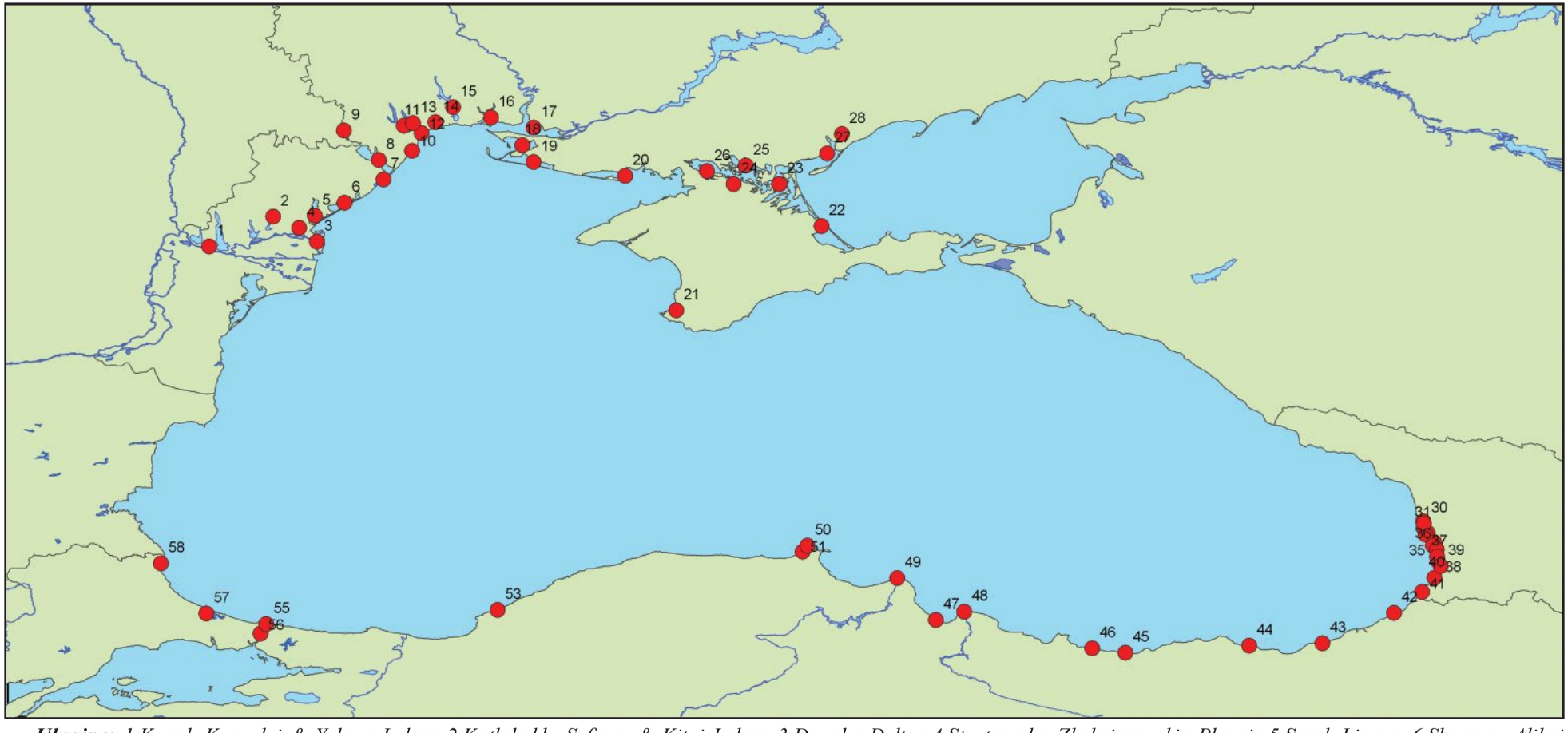
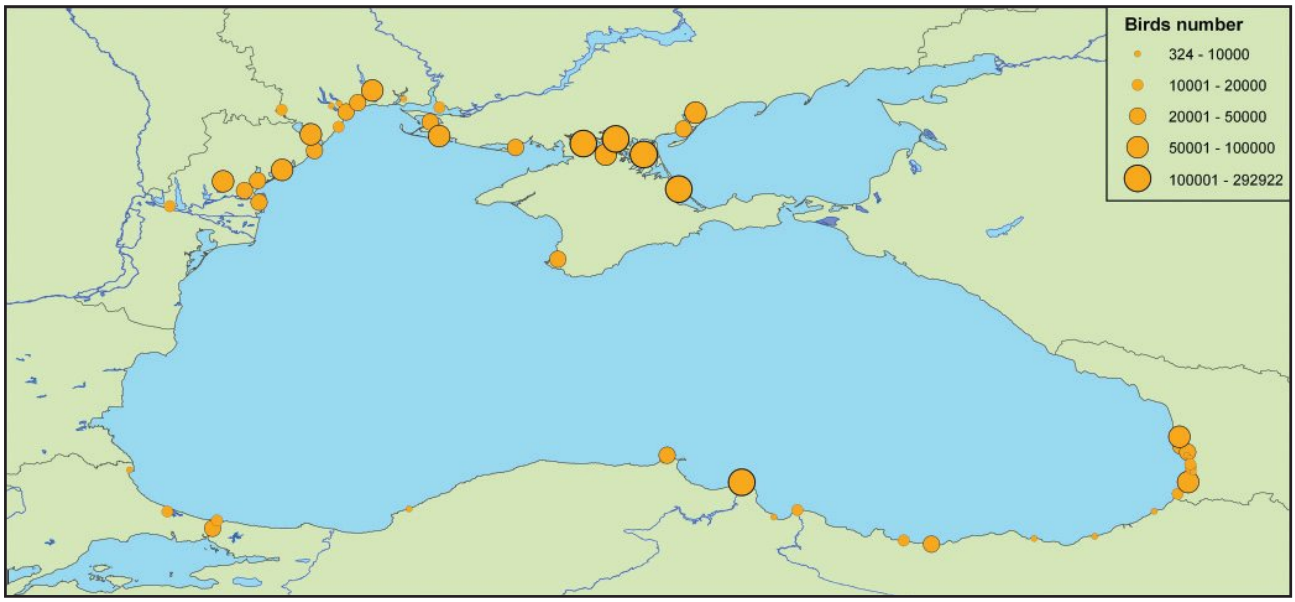
Giorgi Darchiashvili	Tbilisi Zoo, Deputy director	g_darch@hotmail.com, giorgi@zoo.ge	
Lexo Gavashelishvili	Ilia State University, Associate Professor, Researcher	kajiri2000@yahoo.com	
Zurab Javakhishvili	Ilia State University, Associate Professor, Researcher	Zure17@gmail.com	
Revaz Jhordania	Tbilisi State University, Professor		
Levan Rusishvili	Georgian Centre for Conservation of Wildlife	Levani99@yahoo.com, levan@gccw.org	



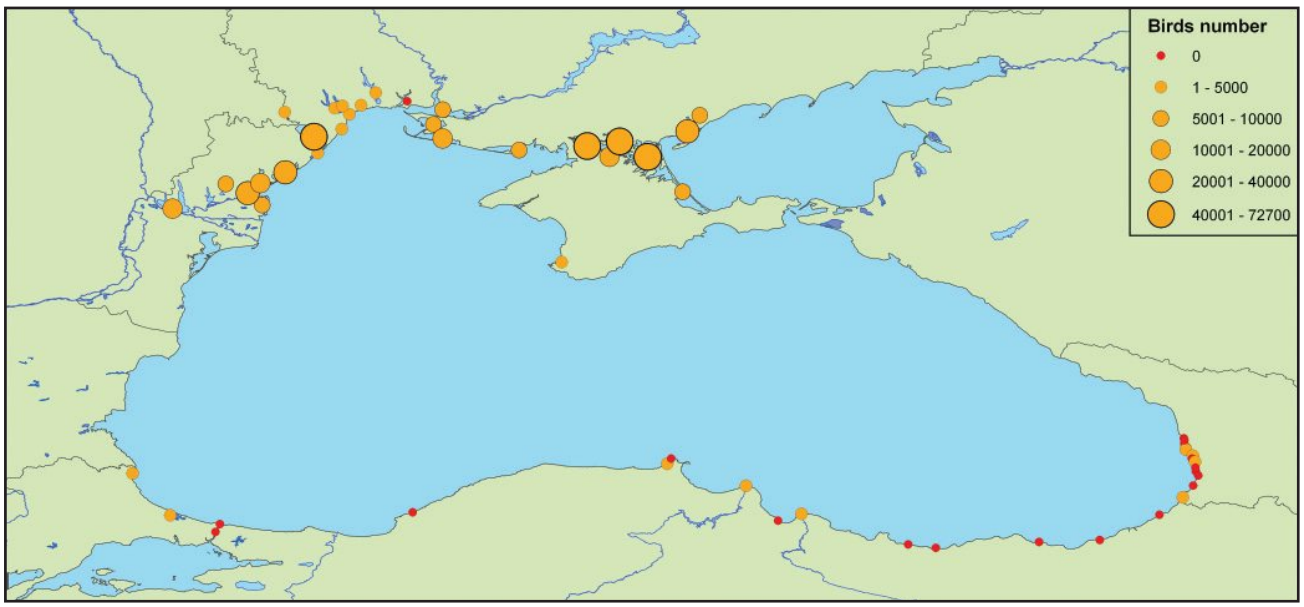
Ukraine: *1.Kagul, Kugurlui & Yalpug Lakes; 2.Katlabukh, Safiany & Kitai Lakes; 3.Danube Delta; 4.Stentsovsko–Zhebrianovskie Plavni; 5.Sasyk Liman; 6.Shagany, Alibei & Burnas Limans; 7.Budakskii & Gribovskii Limans; 8.Dniester Liman; 9.Dniester Delta & Kuchurganskii Liman; 10.Sukhoi Liman; 11.Khadzibeiskii Liman; 12.Odessa Bay; 13.Kuyalnitskii Liman; 14.Adzhalykskii Limans; 15.Tiligulskii Liman; 16.Berezanskii Liman; 17.Dniepro–Bugskii Liman; 18.Yagorlytskii Bay; 19.Tendrovskii Bay; 20.Dzharylgachskii Bay; 21.Sevastopol Bays; 22.Southern part of Eastern Sivash; 23.Northern part of Eastern Sivash; 24.Southern part of Central Sivash; 25.Northern part of Central Sivash; 26.Western Sivash; 27.Utlukskii & Sivashik Limans; 28.Molochnyi Liman.* ***Georgia:*** *29.Churia Marshes; 30.Black Sea coast outside KNP; 31.Black Sea coast within KNP; 32.Partotskali Lake; 33.Rioni River Delta; 34.Paliastomi Lake; 35.Peat Cuttings; 36.Khidmaghala Fishponds; 37.Black Sea coast: Ureki – Poti; 38.Black Sea coast: Kobuleti - Ureki; 39.Ispani Marshes; 40.Black Sea coast: Batumi – Kobuleti; 41.Chorokhi River Delta.* ***Turkey:*** *42.Artvin Coast; 43.Rize Coast; 44.Trabzon Coast; 45.Giresun Coast; 46.Ordu Coast; 47.Samsun Coast; 48.Yeşilırmak Delta; 49.Kizilirmak Delta; 50.Sinop Coast; 51.Sarikum Lake; 52.Amasra Coast; 53.Zonguldak Coast; 54.Sakarya Delta; 55.Istanbul Coast; 56.Bosphorus; 57.Terkos Lake; 58.Igneada.*

Pic. 6 Location of count sites

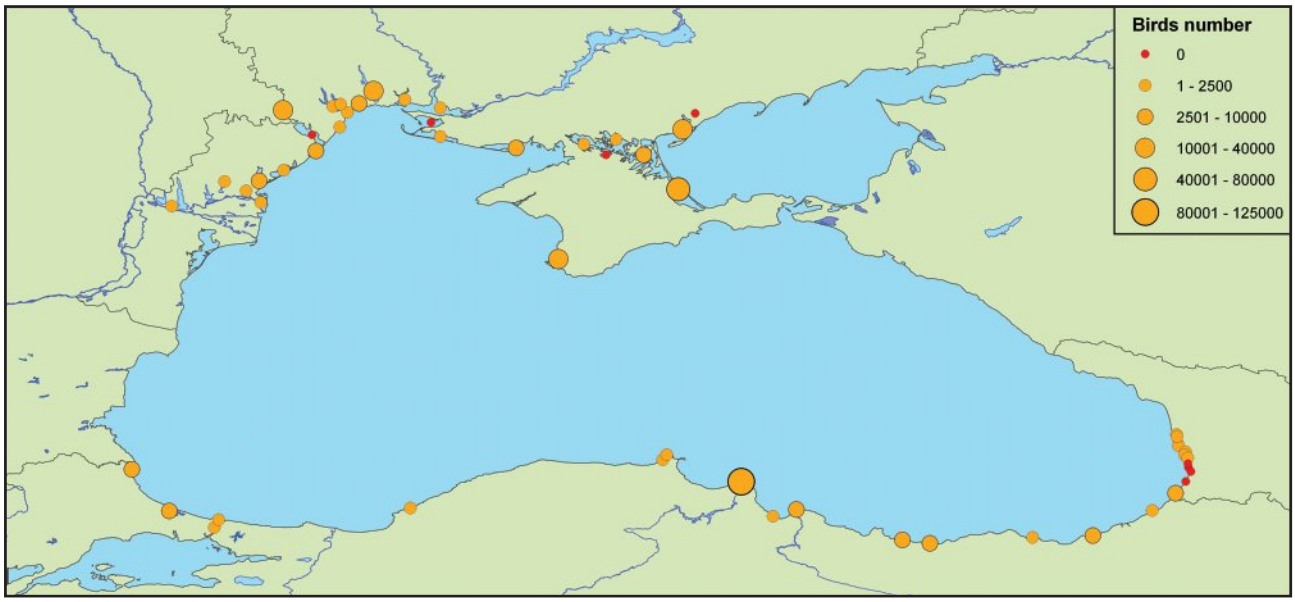


Pic. 14 Distribution of all species of wintering waterbirds (*max. number per site*)

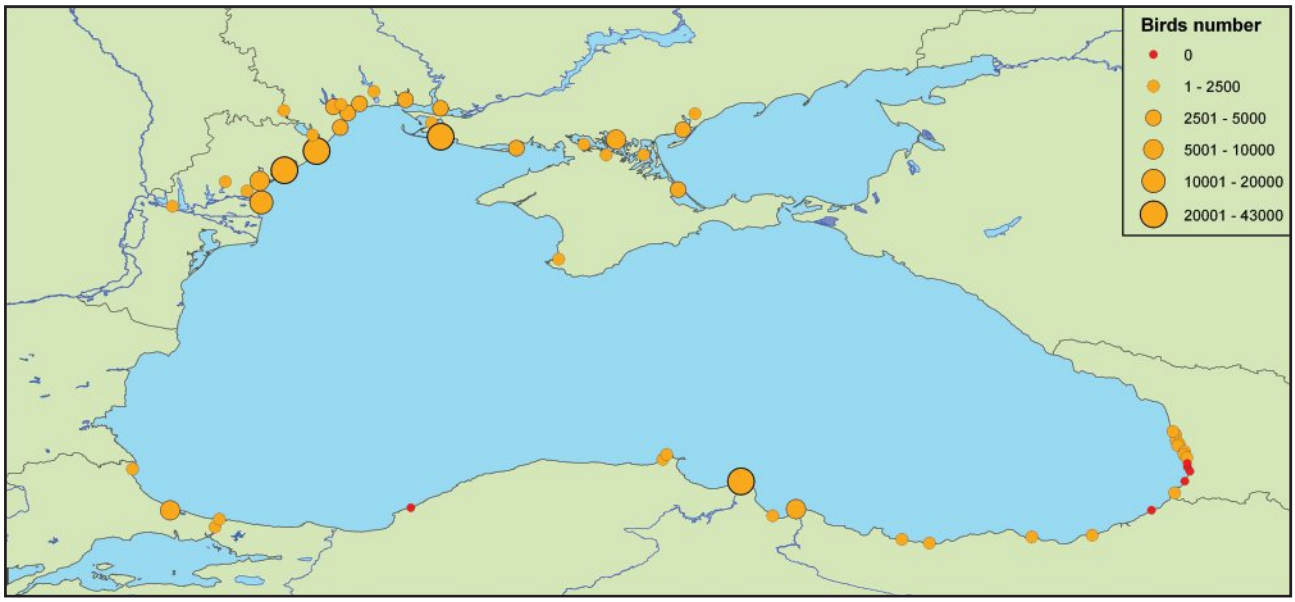
Pic. 15 Distribution of Anas platyrhynchos among count sites (*max. number per site*)



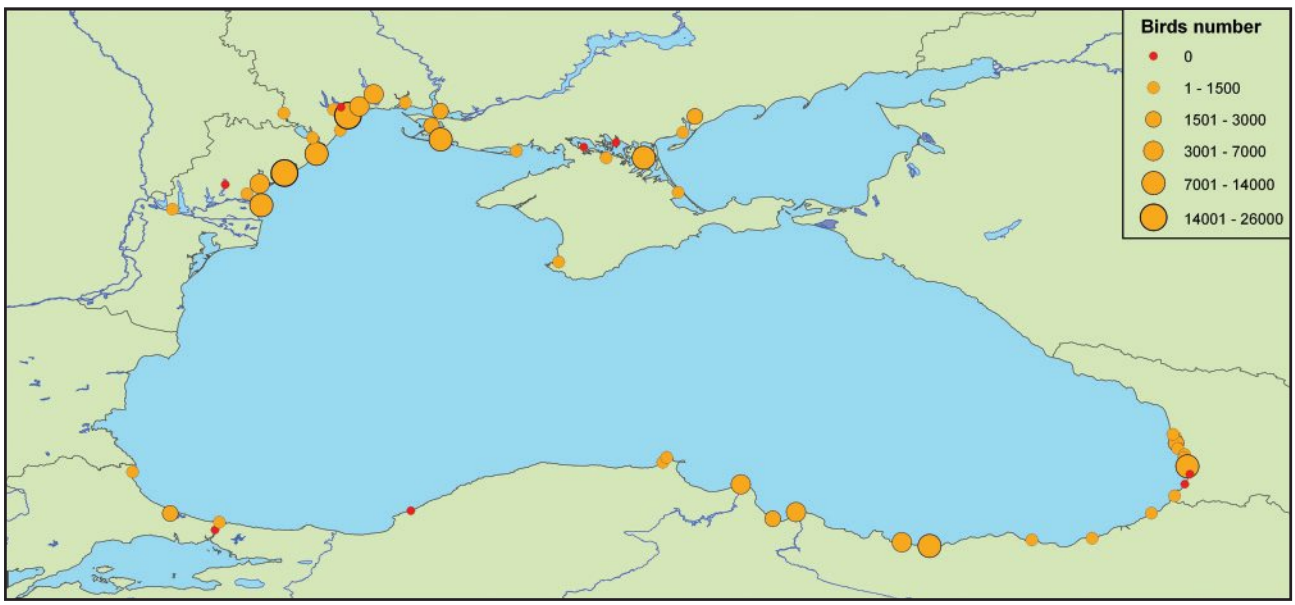
Pic. 16 Distribution of Anser albifrons among count sites (*max. number per site*)



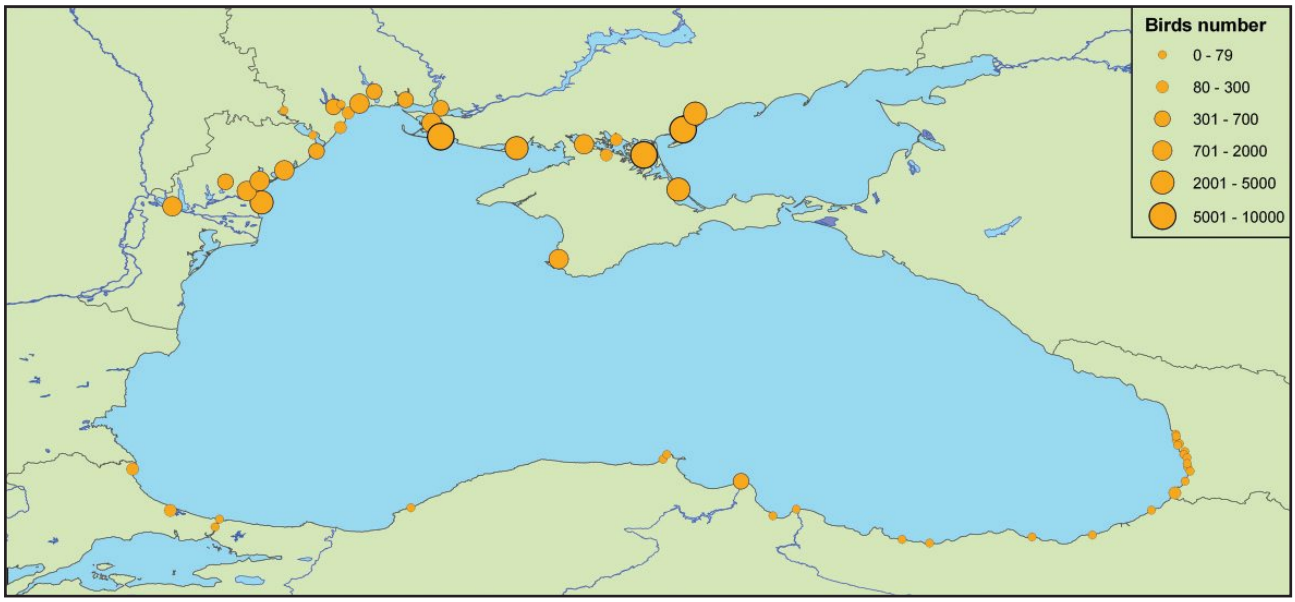
Pic. 17 Distribution of Fulica atra among count sites (*max. number per site*)



Pic. 18 Distribution of Aythya ferina among count sites (*max. number per site*)



Pic. 19 Distribution of Aythya fuligula among count sites (*max. number per site*)



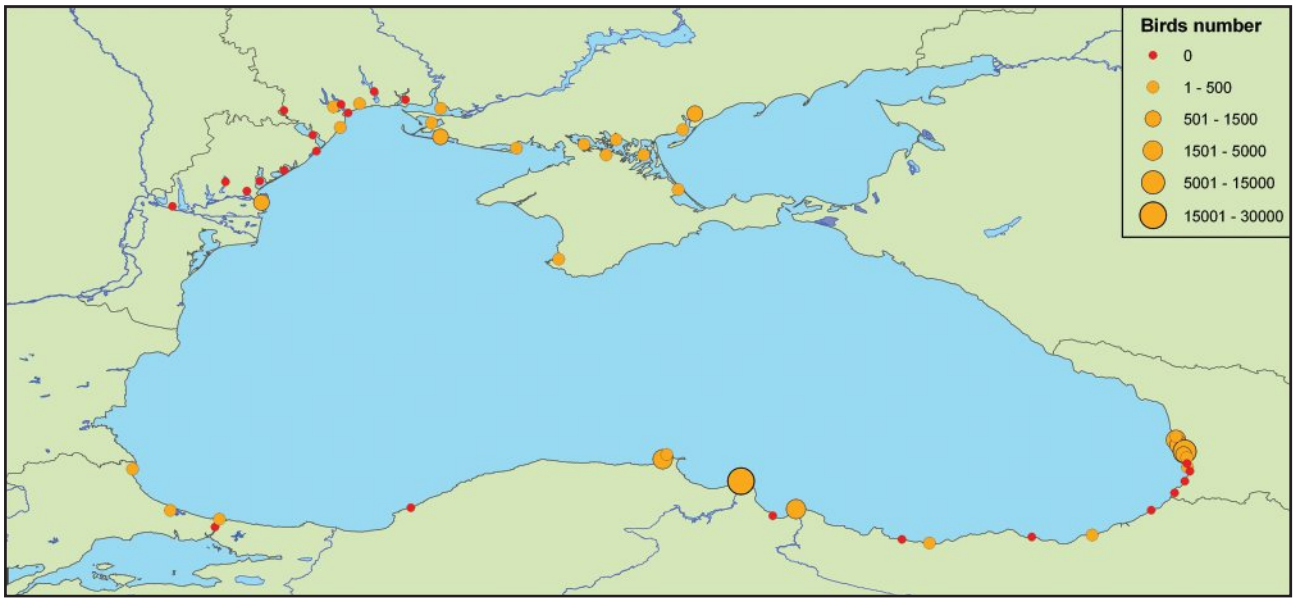
Pic. 20 Distribution of Cygnus olor among count sites (*max. number per site*)

Pic. 21 Distribution of Larus ridibundus among count sites (*max. number per site*)

Pic. 22 Distribution of Larus cachinnans among count sites (*max. number per site*)

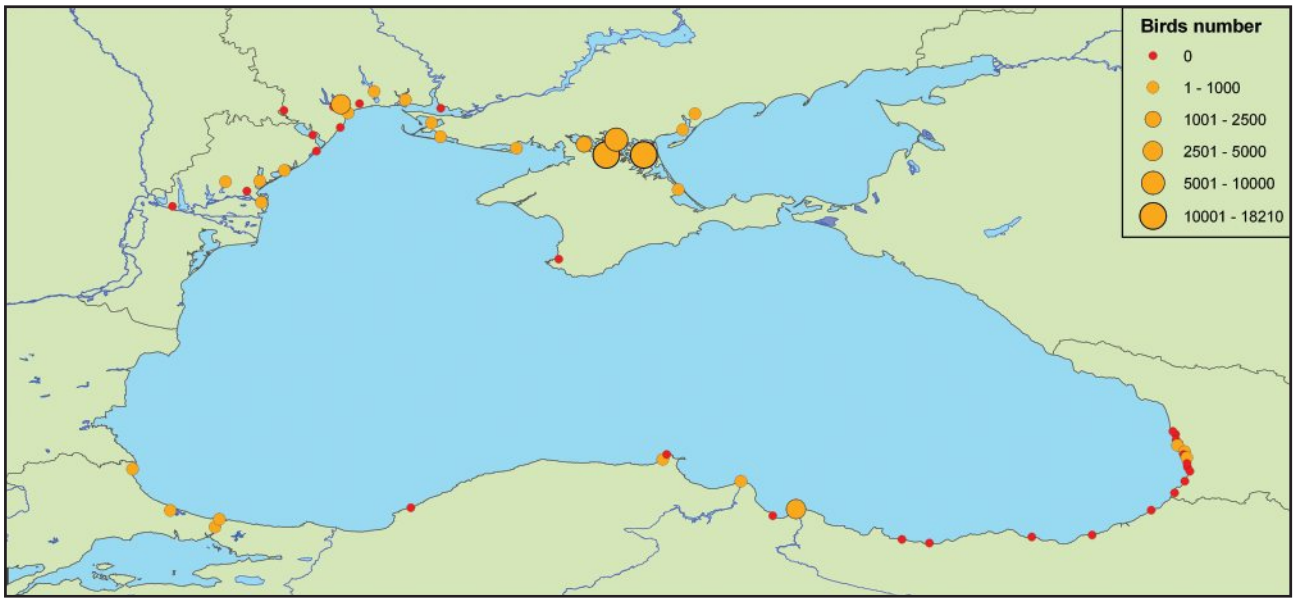
Pic. 23 Distribution of Podiceps cristatus among count sites (*max. number per site*)

Pic. 24 Distribution of Aythya marila among count sites (max. number per site)

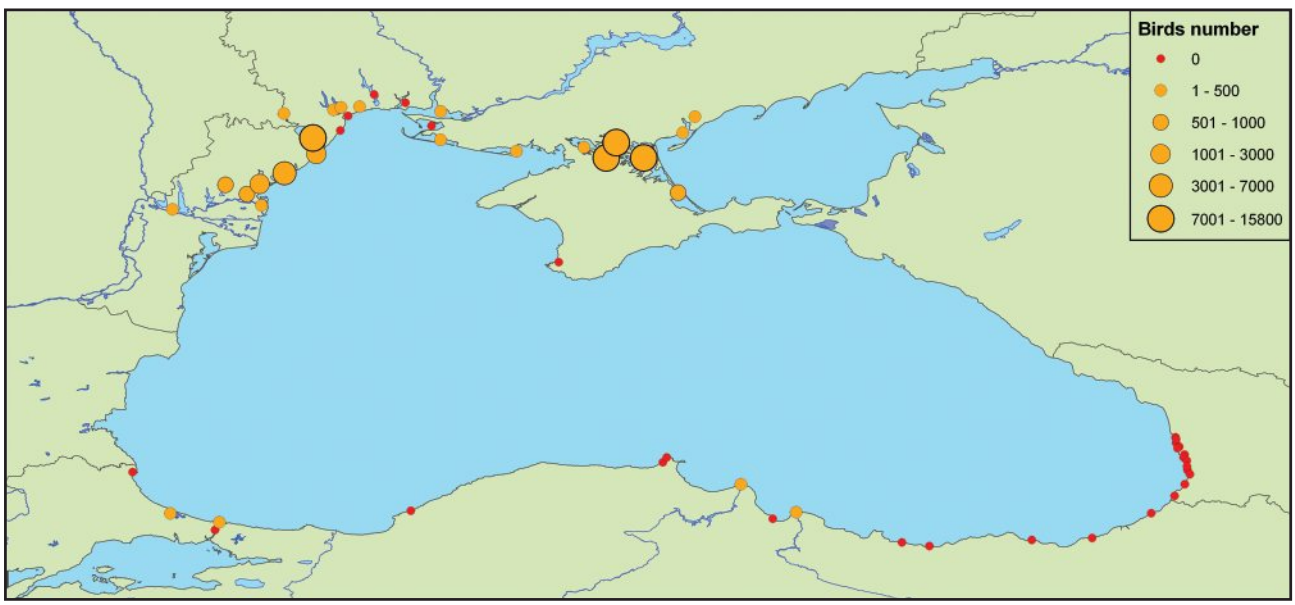


Pic. 25 Distribution of Anas crecca among count sites (max. number per site)

Pic. 26 Distribution of Larus canus among count sites (max. number per site)



Pic. 27 Distribution of Tadorna tadorna among count sites (*max. number per site*)



Pic. 28 Distribution of Branta ruficollis among count sites (max. number per site)