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AVIFAUNA OF ZEMBORZYCKI RESERVOIR IN LUBLIN

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Summary. Zemborzycki Reservoir (280 ha) is situated in Lublin, eastern Poland. Thirty four censuses of waterfowl were carried out in 2005-2006. A total of 48 water bird species was observed, including 5 breeding species *Non-Passeriformes* and 6 breeding *Passeriformes*. The most numerous species were: Mallard, Black-headed Gull, Coot and Tufted Duck. Zemborzycki Reservoir plays an important role in the Lublin region as a feeding and resting area for waterfowl during migrations.

Key words: waterfowl, migration, reservoir, Lublin region

INTRODUCTION

Dam reservoirs are the most important places for many species of water birds in breeding and post-breeding period [Dyrcz 1989, Sidło *et al*. 2004]. They are places where a lot of water birds assemble, especially during their migrations [Wesołowski and Winiecki 1988]. The main aim of the study was to determine the importance of Zemborzycki Reservoir for waterfowl in different periods of the annual cycle.

STUDY AREA, MATERIALS AND METHODS

Zemborzycki Reservoir is situated in the southern part of the city Lublin (N 51°10'; E 22º31', Zemborzyce district). It was built in the Bystrzyca River Valley in 1974 and it has mainly retention and recreation functions. It is one of the largest water bodies in the Lublin region. When the reservoir is filled to the maximum, its surface covers 280 ha (maximum length – 3850 m, maximum width – 1350 m, shore line – 13 km) with a maximum depth of 2.2 m. This artificial reservoir lacks bigger patches of emergent vegetation. The eastern part of the water body is surrounded by pine-oak forest and the western shore is adjacent to agricultural areas.

The material was collected during the fieldwork conducted in 2005-2006. Counts were carried out from the beginning of March, 2005, to the end of February, 2006, once in one decade. In total, 34 surveys of the reservoir were conducted. Telescopes 20-40× and binoculars 8-10×50 were used. During each survey an observer always moved along the

whole reservoir trying to note all the birds within scope range, taking into account movements of individuals and flocks to avoid counting the same birds twice. To estimate the size of waterfowl populations, the methods proposed by [Borowiec *et al*. 1981, Ranoszek 1983, Czapulak *et al*. 1988, Dombrowski *et al*. 1993] have been generally applied.

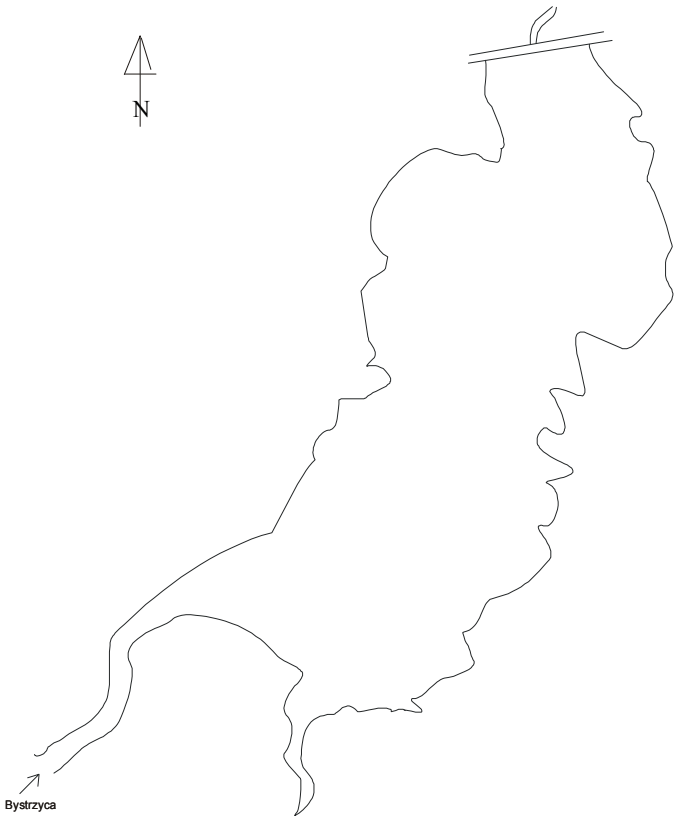

Fig. 1. The Zemborzycki Reservoir
Rys. 1. Zalew Zemborzycki

RESULTS

During the study period a total of 18744 water birds from 48 species was observed (Tab. 1), including 5 breeding species of *Non-Passeriformes*: Mallard *Anas platyrhynchos* (59 pairs), Pochard *Aythya ferina* (6 pairs), Tufted Duck *Aythya fuligula* (17 pairs), Coot F*ulica atra* (3 pairs), Moorhen *Gallinula chloropus* (2 pairs), and 6 breeding species of *Passeriformes*: Sand Martin *Riparia riparia* (203 pairs), Sedge Warbler *Acrocephalus schoenobaenus* (3 pairs), Reed Warbler *Acrocephalus scirpaceus* (2 pairs), Marsh Warbler *Acrocephalus palustris* (1 pair), Great Reed Warbler *Acrocephalus arundinaceus* (2 pairs), Reed Bunting *Emberiza schoeniclus* (2 pairs).

Table 1. Status of the occurrence of individual species of water birds on Zemborzycki Reservoir
Tabela 1. Wykaz gatunków ptaków wodno-błotnych stwierdzonych na Zalewie Zemborzyckim

Species – Gatunki	Status	Species – Gatunki	Status
Gavia arctica	V	*Circus aeruginosus*	V
Tachybaptus ruficollis	N, Ma, W	*Gallinula chloropus*	B
Podiceps grisegena	N	*Fulica atra*	B, Ma, Ms, W
Podiceps cristatus	Ms, N, Ma	*Vanellus vanellus*	Ms, N, Ia
Podiceps auritus	V	*Tringa glareola*	Ma
Podiceps nigricollis	V	*Actitis hypoleucos*	Ms, N, Ma
Phalacrocorax carbo	Ma, W	*Calidris alpina*	Ma
Ardea cinerea	Is, N, Ma, W	*Larus canus*	Ms, Ma, W
Egretta alba	V	*Larus fuscus*	Is, Ia
Ciconia ciconia	V	*Larus argentatus*	Ms, N, Ma, W
Cygnus olor	Ms, N, Ma, W	*Larus ridibundus*	Ms, N, Ma, W
Anser fabalis	Ia	*Larus minutus*	Ms, Ia
Anser albifrons	Is, W	*Sterna hirundo*	Ms, N, Ma
Anser anser	Is	*Sternula albifrons*	V
Anas penelope	Is, Ma, W	*Chlidonias leucopterus*	Ms
Anas strepera	Ms	*Chlidonias niger*	Ms
Anas crecca	Ms, N, Ma, W	*Alcedo atthis*	Ma, W
Anas platyrhynchos	B, Ms, Ma, W	*Riparia riparia*	B
Anas querquedula	Ms, N, Ia	*Locustella naevia*	N
Aythya ferina	B, Ms, Ma, W	*Acrocephalus schoenobaenus*	B
Aythya fuligula	B, Ms, Ma,	*Acrocephalus scirpaceus*	B
Melanitta fusca	V	*Acrocephalus palustris*	B
Bucephala clangula	Is, Ma, W	*Acrocephalus arundinaceus*	B
Mergus merganser	Ms, Ma, W	*Emberiza schoeniclus*	B

Status: B – breeding in reservoirs and/or the adjacent area; Nn – non-breeding species observed during the breeding period; Ms – regularly migrating during the spring migration; Ma – regularly migrating during the autumn migration; Is – irregular spring migrant; Ia – irregular autumn migrant; V – rare visitor (recorded less than four times, 1-3 ind.); W – regularly recorded in winter months (XII-II)
Status występowania: B – lęgowy na zbiorniku i/lub na terenie przylegającym do zbiornika; Nn – gatunek nielęgowy obserwowany w okresie lęgowym; Ms – przelotny lub przylatujący (stacjonujący regularnie) podczas wędrówki wiosennej; Ma – przelotny lub przylatujący (stacjonujący regularnie) podczas wędrówki jesiennej; Is – zalatujący w okresie wędrówki wiosennej; Ia – zalatujący w okresie wędrówki jesiennej; V – zalatujący (stwierdzony poniżej czterech razy, 1-3 os.); W – zimujący (wielokrotnie stwierdzany w miesiącach XII-II)

The density of breeding waterfowl species was low: 0.1-2.1 pairs/10 ha (Tab. 2).

Table 2. Breeding status of waterfowl species *Non-Passeriformes* on Zemborzycki Reservoir
Tabela 2. Liczebność lęgowych gatunków ptaków wodno-błotnych *Non-Passeriformes*

Species – Gatunki	1	2	3	4
Anas platyrhynchos	59	2.1	61	393
Aythya fuligula	17	0.6	10	56
Aythya ferina	6	0.2	1	8
Fulica atra	3	0.1	15	86
Gallinula chloropus	2	0.1	4	18

1 – number of breeding pairs; 2 – mean density (pairs/10 ha); 3 – total number of families is expressed as a sum of all families observed; 4 – total number of nestlings is expressed as a sum of all nestlings observed
1 – liczba par lęgowych; 2 – zagęszczenie par na 10 ha; 3 – łączna liczba rodzin, wyrażona jako suma wszystkich obserwowanych rodzin; 4 – łączna liczba młodych, wyrażona jako suma wszystkich obserwowanych młodych

Fourteen other non-breeding species were observed during the breeding period. Twenty nine species occurred in the spring migration and thirty one species were recorded during the autumn passage. In the whole studied period the most numerous species were (Tab. 3): Mallard (388.4 individuals/survey), Black-headed Gull *Larus ridibundus* (83.6 individuals/survey), Coot (21.9 individuals/survey) and Tufted Duck (13.1 individuals/survey). In winter (December-February), 16 bird species were also observed.

Table 3. Number of water bird species *Non-Passeriformes* observed on Zalew Zemborzycki during the whole annual cycle
Tabela 3. Liczebność gatunków ptaków wodno-błotnych *Non-Passeriformes* stwierdzonych na Zalewie Zemborzyckim w cyklu rocznym

Species – Gatunki	1	2	3	4	Species – Gatunki	1	2	3	4
Gavia arctica	2	0.011	0.059	1	*Melanitta fusca*	1	0.005	0.0294	1
Tachybaptus ruficollis	141	0.752	4.147	18	*Bucephala clangula*	12	0.064	0.3529	7
Podiceps grisegena	2	0.011	0.059	1	*Mergus merganser*	24	0.128	0.7059	10
Podiceps cristatus	56	0.299	1.647	16	*Circus aeruginosus*	1	0.005	0.0294	1
Podiceps auritus	1	0.005	0.029	1	*Gallinula chloropus*	37	0.197	1.0882	5
Podiceps nigricollis	2	0.011	0.059	1	*Fulica atra*	746	3.98	21.941	128
Phalacrocorax carbo	12	0.064	0.353	11	*Vanellus vanellus*	2	0.011	0.0588	1
Ardea cinerea	62	0.331	1.824	25	*Tringa glareola*	6	0.032	0.1765	6
Egretta alba	4	0.021	0.118	4	*Actitis hypoleucos*	51	0.272	1.5	13
Ciconia ciconia	2	0.011	0.059	1	*Calidris alpina*	8	0.043	0.2353	8
Cygnus olor	118	0.63	3.471	22	*Larus canus*	139	0.742	4.0882	54
Anser fabalis	1	0.005	0.029	1	*Larus fuscus*	6	0.032	0.1765	4
Anser albifrons	5	0.027	0.147	2	*Larus argentatus*	168	0.896	4.9412	24
Anser anser	1	0.005	0.029	1	*Larus ridibundus*	2842	15.16	83.588	831
Anas penelope	13	0.069	0.382	8	*Larus minutus*	71	0.379	2.0882	70
Anas strepera	12	0.064	0.353	9	*Sterna hirundo*	262	1.398	7.7059	116
Anas crecca	65	0.347	1.912	20	*Sternula albifrons*	2	0.011	0.0588	2
Anas platyrhynchos	13206	70.45	388.4	1426	*Chlidonias leucopterus*	102	0.544	3	100
Anas querquedula	10	0.053	0.294	7	*Chlidonias niger*	18	0.096	0.5294	16
Aythya ferina	80	0.427	2.353	17	*Alcedo atthis*	6	0.032	0.1765	3
Aythya fuligula	445	2.374	13.09	74	Total	18744	100	551.29	3066

1 – total number of individuals recorded in all surveys; 2 – dominance (%); 3 – mean number of individuals in one survey; 4 – maximum number in one survey
1 – łączna liczebność osobników; 2 – udział procentowy poszczególnych gatunków (%); 3 – średnia liczba ptaków na kontrolę; 4 – maksymalna liczebność

DISCUSSION

Within the period of the study only 5 breeding waterfowl species were recorded at the study area. In comparison to other Polish dam reservoirs, Zemborzycki Reservoir has a poor breeding avifauna [Oleksik 1992, Stawarczyk and Karnaś 1992, Dyrcz *et al*. 1998, Janiszewski *et al*. 1998, Tabor *et al*. 1999, Kawa 2004]. It is probably connected with the lack of appropriate nesting habitat (patches of emergent vegetation, sandy or muddy islands), short period of study, human pressure (recreation and fishing). An additional negative factor affecting feeding conditions in recent years may be the algae blooms which are „an ecological trap" for breeding water birds. Previous studies strongly indicated that the availability and abundance of food resources may influence reproduction of waterfowl [Elmberg *et al*. 1994]. Large lowland dam reservoirs play an important role as feeding and

resting areas for waders *Charadrii* during migration [Dyrcz *et al*. 1998, Janiszewski *et al*. 1998, Stawarczyk and Karnaś 1992]. A distinctive feature of Zemborzycki Reservoir species assemblage, in comparison with other Polish dam reservoirs, is a low number of migrating waders. It is affected by small fluctuations of water level and lack of muddy habitats closed with the presence of exposed areas of reservoir bottom.

CONCLUSION

Zemborzycki Reservoir is one of the most important water reservoirs in the Lublin region for migrating water birds. Large concentrations of such species as Mallard – 1426 ind., Black-headed Gull – 831 ind., Coot – 128 ind., Common Tern *Sterna hirundo* – 116 ind., White-winged Black Tern *Chlidonias leucopterus* – 100 ind., Little Gull *Larus minutus* – 70 ind., Common Gull *Larus canus* – 54 ind., were recorded. Close location of a large city (above 400 000 inhabitants) causes that Zemborzycki Reservoir is used as an important roosting site for wondering and migrating gulls *Laridae*. Because of the strong eutrophication and plant succession we can expect changes of abundance and bird species composition breeding at this site in future years. The major threats to the avifauna of Zemborzycki Reservoir include increased intensity of recreation (especially water sports) and fishermen's pressure, water pollution of industrial and farming origin and, resulting from this, progressing eutrophication.

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AWIFAUNA ZALEWU ZEMBORZYCKIEGO W LUBLINIE

Streszczenie. Zalew Zemborzycki jest sztucznym zbiornikiem położonym w Lublinie. Zajmuje obszar około 280 ha. Badania prowadzono w cyklu rocznym, od marca 2005 do lutego 2006 r., łącznie przeprowadzono 34 kontrole. Stwierdzono 48 gatunków ptaków wodno-błotnych, w tym 11 gatunków lęgowych. W okresie przelotu wiosennego odnotowano 29 gatunków, jesiennego – 31, zimą – 16. Najliczniejszymi, regularnie obserwowanymi gatunkami były: krzyżówka (388,4 osobnika/kontrolę), śmieszka *Larus ridibundus* (83,6 osobnika/kontrolę), łyska (21,9 osobnika/kontrolę) i czernica (13,1 osobnika/kontrolę).

Słowa kluczowe: ptaki wodno-błotne, wędrówki, zbiornik zaporowy, Lubelszczyzna