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AVIFAUNA OF CHOSEN FISH POND COMPLEXES IN LUBLIN PROVINCE

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Summary. In the springtime of 2003 and 2004 species of birds were recognizes and their population was calculated on the stable transects. Altogether there are 47 species, most of which are found in the ponds in Tarnawatka (38), in Imielty Ług (27) and in Borki (25). In 2004 the number of species in Tarnawatka fell from 30 to 25, in Borki from 25 to 22 and in Imielty Ług it rose from 16 up to 22. The gull was the most common species of the avifauna and their participation in Tarnawatka and Imielty Ług was between 76-95 while in Borki – 23% of the all birds. The biggest number of birds during one day was observed in Tarnawatka, next in Imielty Ług and the smallest number in Borki. Calculating 1 km of a transect, the biggest number of birds was seen in Imielty Ług – more than 500, next in Tarnawatka – about 200 and in Borki – about 50.

Key words: avifauna, fish ponds, species diversity

INTRODUCTION

The number of birds living in hydro-mud habitats has been systematically decreasing since the 1950s and the causes of this phenomenon are different, the most popular among them being decreasing natural area of these habitats, lowering of an underground water level as far as pressure of predators [Fruziński 1965, 2002, Rutkowski 2003]. The use of fish ponds by these birds would hinder an inconvenient direction of changes, but there are some causes that make this use difficult. One of the ways supporting a nest building on ponds was an increase in hatching through setting up hatching baskets [Fruziński 2002]. Such baskets in Borki in the 1970s were settled by *Anas platyrhynchos* at about 75% [Dziedzic and Wielbo 1976]. But in the 1990s not only in Borki, but also on other ponds the percentage of the settled nests did not exceed 17% [Dziedzic *et al.* 1999]. This situation was interpreted as a small number of birds living in natural nesting places.

The purpose of the thesis was to give a precise number of species in different fish ponds complexes.

RESEARCH AREA

The research was done in three pond complexes which differed with localization, their age, size, coastal plant belts and surrounding habitats (Fig. 1).

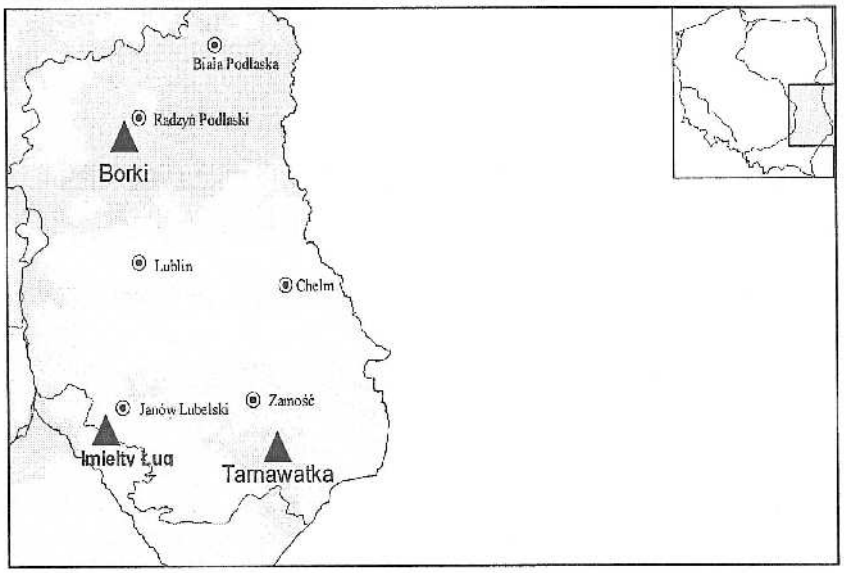

Fig. 1 Localization of research area
Rys. 1. Lokalizacja terenu badań

Ponds in Tarnawatka were set up in XIX c. Today, fish breeding is carried out in five ponds, whose total area is 468 hectares and coastal belts, on average, are overgrown with rushes in 15%. There are also small, natural islands. There are forest complexes in the nearest neighbourhood with the domination of humid, fresh and marshy woods. In various land depressions you can find small ponds covered with rush. There is grassland (pastures and meadows) and arable land, where crops, corn and rape are grown.

The Imielty Ług pond came into being over 100 years ago. It covers the area of 803 hectares. Today this is a sanctuary with 150 hectares of fishing area. The coastal belt is overgrown with rushes in about 40%. There are forests around – wood habitats.

The pond complex in Borki has existed for over 50 years and consists of eight ponds with the total area of 78 hectares. The coastal belt is very poor and it is mowed periodically. There is intensive fish breeding on the area. There is a forest complex in the north with mixed woods, grassland (meadows) which is not arable in the east and in the west. The depth of these pond complexes is similar – between a meter and two.

MATERIAL AND METHODS

Recognizing and counting of the birds were done on transects which were, in each case, stable within the whole period of research. In Tarnawatka, the length of the transect was 6.7 km, which is about 41% of the total pond area. In Imielty Ług the transect

was 4 km long with the 19% of the study area. In Borki it was 3.2 km long, which practically covered the whole area of the ponds (100%). The research was done in spring (April, May, June). In 2003 in each pond complex in the morning hours during three days (IV, V, VI) the transect was moved on (4-6 hours). Ornithological binoculars were used for observations. In 2004 research was done on the same transects in the same complexes in April and May (two days) according to principles used in the previous year. The recognition of birds was done by means of their appearance, voice and behaviour. Keys to the recognition of birds were used [Cramp 1985, Jonsson 1998, Svensson *et al.* 1999].

RESULTS

There were 30 species of birds of 8 orders on Tarnawatka ponds in 2003. The most representatives were of *Anseriformes* – 10 species, the most common species was *Larus ridibundus* – 3258 individuals seen throughout three control terms (Tab. 1). During the next year the number of the species changed and the following birds were not observed: *Tachybabtus ruficollis, Podiceps grisegena, Phalacrocorax carbo, Botaurus stellaris, Mergus serrator, Gallinula chloropus* and *Charadrius hiaticula,* but new species appeared: *Egretta alba, Anas clypeata, Mergus merganser, Pandion haliaetus, Rallus aquaticus, Gallinago gallinago, Tringa ochropus* and *Chlidonias leucopterus.* Between these two years, the changes in the number structure were small – particularly among orders richer in the number of birds.

Table 1. The number of species on ponds in Tarnawatka, Borki and Imielty Ług
Tabela 1. Liczba gatunków na stawach w Tarnawatce, Borkach i Imieltym Ługu

Orders Rzędy	2003			2004		
	Tarnawatka	Borki	Imielty Ług	Tarnawatka	Borki	Imielty Ług
	n					
Podicipediformes	4	1	2	2	1	-
Pelecaniformes	1	-	1	-	-	-
Ciconiformes	3	3	2	3	3	1
Anseriformes	8	5	6	9	5	6
Falconiformes	1	1	1	2	2	3
Gruiformes	2	1	1	2	1	4
Charadriformes	5	6	1	6	5	3
Larii	6	6	1	7	5	4

On Imielty Ług pond in 2003 there were 15 species of 8 orders. During the next year, the number of species increased up to 21 but the number of orders decreased to 6 (Tab. 1). *Podicipediformes* and *Pelecaniformes* species were not observed at all. In 2004, generally, 12 new species appeared, including rare species in our avifauna – *Haliaetus albicilla, Pandion haliaetus, Cygnus cygnus.* There were not meaningful changes in the structure of the number within particular species.

On ponds in Borki, the differences between the two analyzed years were small and in 2004 the number of the species was smaller by one and the species structure was the most stable (Tab. 1). In 2004 the following species disappeared: *Charadrius dubius, Calidris alpina* and *Chlidonias hybridus*. Two – *Actitis hypoleucos* and *Circus pygargus* – appeared. The structure of the number within particular orders of species was equal.

Comparing the avifauna among complexes, some differences in the structures of species and number can be observed. In Tarnawatka and Imielty Ług there were representatives of 8 orders and the order of *Anseriformes* was the most common (10 species in Tarnawatka and 8 in Imielty Ług). In Borki, the number of the orders was smaller by one (no *Phalacrocorax carbo* found) but the order *of Anseriformes* (5 species) and *Gruiformes* (1) was even poorer.

DISCUSSION

The results show that on the ponds in Tarnawatka there is the most variable number of species (n = 38) and in Imielty Ług and Borki the number of species is equal (n = 27 and n = 25). A rich bird state on ponds in Tarnawatka was noticed over 40 years ago by Riabinin [1963]. The black-headed gull in Tarnawatka and Imielty Ług is the basic species in the quantity structure (78 and 96%) and in Borki – 8%. Calculating the population of birds registered during a day on 1 km of transect it was proved that in Imielty Ług about 520 birds were observed, in Tarnawatka about 200 and in Borki about 50. The difference, above all, was due to the population of gull flocks in the first two complexes. The next indicator which appears by this calculation is a decrease of the number of birds between years. In the year 2004 in Tarnawatka the drop in the number of birds was about 20%, in Borki – about 24%, in Imielty Ług the indicator decreased by 2%, which can be explained as stabilization.

Environmental conditions affect the difference of the avifauna among pond complexes. The biggest natural value in Tarnawatka results in a big variety of surrounding habitats. Meadows, grassland and varied forest habitats have an influence on rich food base and hatching conditions. The area of Imielty Ług is surrounded by forests which are not so verified as the one in Tarnawatka. The pond complex in Borki is intensively used for fishing and mowing the coastal belt and fluctuations of the water surface during the time of nest building affect the nesting itself. Despite the fact that the neighbouring areas are diversified and provide a proper food base, any limitations in the nesting factor are crucial for the population of birds.

The research was done on the area of three fish pond complexes covering 87, 468 and 803 hectares that differed in intensity of fish breeding, coastal plant belt and surrounding habitats.

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AWIFAUNA WYBRANYCH KOMPLEKSÓW STAWÓW RYBNYCH NA LUBELSZCZYŹNIE

Streszczenie. Badania wykonano na terenie trzech kompleksów stawów rybnych o powierzchniach: 87, 468 i 803 ha, które różniły się intensywnością gospodarki rybnej, przybrzeżną szatą roślinną i otaczającymi siedliskami.

W okresie wiosennym 2003 i 2004 roku na stałych transektach rozpoznawano gatunki ptaków i określano ich liczebność. Łącznie stwierdzono 47 gatunków, najwięcej – 38 na stawach w Tarnawatce, 27 na stawach Imielty Ług i 25 w Borkach. W 2004 roku liczba gatunków w Tarnawatce zmniejszyła się z 30 do 25, w Borkach z 25 do 22, a w Imieltym Ługu wzrosła z 16 do 22. Najliczniejszą grupą awifauny były Mewowce i ich udział w Tarnawatce i Imieltym Ługu mieścił się w przedziale 76-95%, a w Borkach wynosił ok. 23% ogólnej liczby ptaków. Najwięcej ptaków w ciągu jednego dnia obserwowano w Tarnawatce, następnie w Imieltym Ługu, a najmniej w Borkach. W przeliczeniu na 1 km transektu najwięcej ptaków było w Imieltym Ługu – pow. 500, następnie w Tarnawatce – ok. 200 i w Borkach – ok. 50.

Słowa kluczowe: awifauna, stawy rybne, zróżnicowanie gatunkowe