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ICHTHYOFAUNA STRUCTURE IN THE WILDLIFE RESERVE „PISKORY"

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Summary. The natural reserve „Piskory" was funded in 1998 to protect and restore a group of water, boggy, and woody ecosystems with great biological diversity. However, it contains equally valuable fauna resources. In 2005, studies aimed at the evaluating current natural status and changes occurred in Lake Piskory 10 years after renaturization project completed, were begun. Analysis of ichthyofauna structure was one of the project's elements. The ichthyo-biological studies in Reserve „Piskory" revealed the occurrence of 8 fish species from 4 families. The fish species composition greatly varied both in particular years and study seasons. The largest number of species (6) was found in autumn 2006, while the least (2) in autumn 2007–2008. In 2005–2006, moderlieschen, then roach and perch were the most numerous in all study points, whereas in 2007–2008, roach and perch dominated. Other species occurred in small numbers or were represented by single individuals in both time periods.

Key words: ichthyofauna, wildlife reserve, Piskory lake

INTRODUCTION

The wildlife reserve „Piskory" was founded in 1998 to protect and restore a group of water, swamp, and forest ecosystems with great bio-diversity. However, the reserve also has valuable fauna resources.

Piskory Lake is a former backwater of river Wieprz that was converted into fishing ponds in the 60's of the 19th century. In the 70's of the 20th century, the reservoir depth was from 0.5 m to 1.5 m, and its major surface was overgrown by rush communities. Unfortunately, melioration works conducted in the 80's of the 20th century made it almost completely disappeared. The restoration project including 120 hectares of Piskory Lake disappeared 10 years before began in 1993 [Chmielewski and Sielewicz 1996, Kucharczyk 1996, Rafał 1997].

Studies aiming at evaluating the current natural status and changes having occurred in Piskory Lake during 10 years after renaturisation project completion began in 2005 [Poliszuk and Rafałowski 1998, Radwan *et al.* 2000, Chmielewski *et al.* 2005]. The ichthyofauna structure analysis was one of the elements of the project.

Periodically repeated recording of – among others – the ichthyofauna informs on the status of disappearing species, condition of domestic exploited species, appearance and expansion of foreign species and the consequences of such situation for domestic fauna and for the whole biocenosis [Przybylski *et al.* 1998].

MATERIAL AND METHODS

In order to evaluate the current ichthyofauna structure in spring and autumn 2006–2008 cyclic fishing, using power-generating units Jup-12 and Samus 725 MP, were carried out. Fish were weighed (with 1 g accuracy), measured (with 1 mm accuracy), and assigned to a species according to ichthyo-biological key [Brylińka (ed.) 2000].

RESULTS

Ichthyo-biological studies in wildlife reserve „Piskory" revealed the presence of 7 fish species including: pike (*Esox lucius*), roach (*Rutilus rutilus*), tench (*Tinca tinca*), moderlieschen (*Leucaspius delineatus*), crucian carp (*Carassius auratus gibelio*), perch (*Perca fluviatilis*), and ruffe (*Gymnocephalus cernuus*). They represented 4 families: *Esoxidae* (1), *Cyprinidae* (3), *Pericidae* (2), and *Cobitidae* (1).

Table 1. Species composition of ichthyofauna wildlife reserve „Piskory"

Year		2005		2006		2007		2008	
No.	Species Season	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn
1	Pike *Esox lucius*		+			+		+	
2	Tench *Tinca tinca*	+			+	+			
3	Roach *Rutilus rutilus*	+	+	+	+	+	+	+	+
4	Sunbleak *Leucaspius delineatus*	+	+	+	+	+			
5	Prussian carp *Carassius auratus gibelio*		+	+	+				
6	Perch *Perca fluviatilis*	+	+	+	+		+	+	+
7	Ruft *Gymnocephalus cernuus*				+	+			
No. of species		4	5	4	6	5	2	3	2

The fish species composition – both in particular study years and seasons – considerably varied. The largest number of species was found in autumn 2006 (6), while the smallest (2) in autumn 2007–2008.

In 2005–2006, populations of sunbleak, followed by roach and perch, were the most numerous at all study points. In 2007–2008, roach and tench were most often recorded. Other species were present in small numbers in both periods.

The structure of fish domination significantly varied. Moderlieschen dominated for the first two years, and its share was from 65% in 2005 to about 50% in 2006. In spring 2007, its percentage decreased to only 10%, and the species

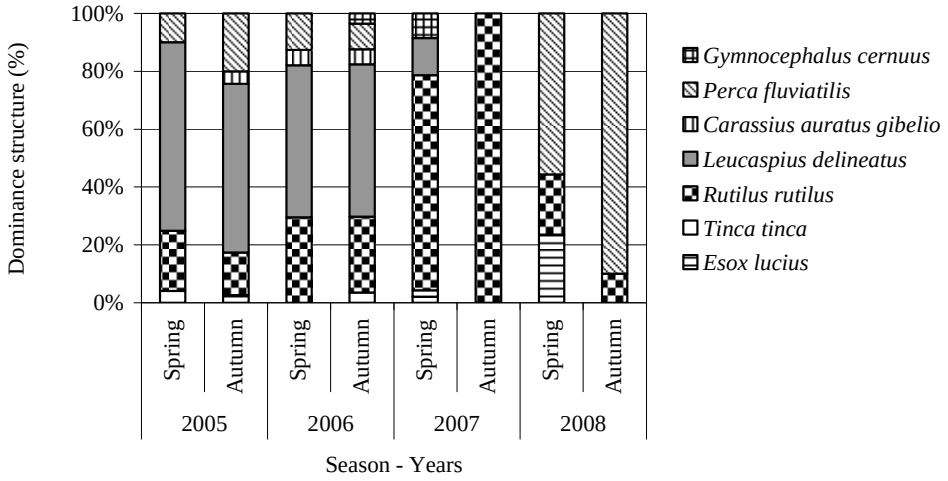

Fig. 1. Fish fauna dominance structure in the wildlife reserve „Piskory”

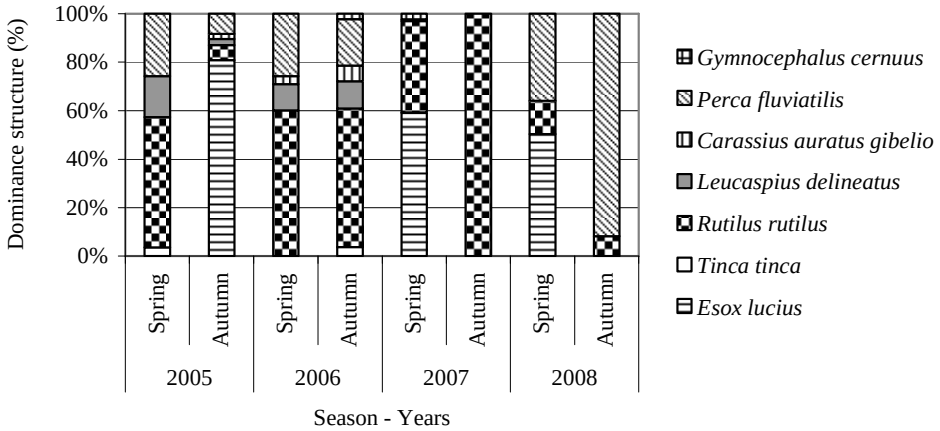

Fig. 2. Fish fauna biomass in the wildlife reserve „Piskory”

was absent in subsequent years. Roach was the second dominant fish species. In the first two years of study, its share ranged from about 20 to 30%, while in 2007 the percentage of the species suddenly increased, reaching 70 in spring up to 100% in autumn. The share of tench in the domination structure in 2005–2007 was low, reaching only from 5 to 20%. Nevertheless, in 2008 its percentage increased to about 70% in spring and to 90% in autumn.

The share in total fish weight also fluctuated, which apparently reflected their populations and growth biology. Roach, pike, and tench dominated in total fish number. Roach dominated first of all in spring 2005, as well as in 2006–2007, pike in autumn 2005–2007, while tench in 2008. The percentage of moderlieschen, perch, crucian carp, and ruffe was low, ranging from several to about 20% of total fish weight.

DISCUSSION

The number of fish species in reservoir Piskory has decreased from 11 to 7 for the last 10 years [Radwan *et al.* 2000]. Currently, no gudgeon, protected weatherfish, and common crucian carp that is more often suppressed by foreign silver crucian carp, were found in the studied lake [Kolejko 2003]. The lack of carp and brown bullhead should be considered as positive. They are introduced species and strange to our domestic ichthyofauna, thus their presence would negatively affect the population of many domestic fish species [Kolejko 2006].

Such great diversity in the structure of ichthyofauna, both during the study and in previous period, was probably associated with unstable hydrological [Rafał 1997] and biocenotic conditions [Kucharczyk 1996]. Phyto- and zoocenoses settling the water reservoir Piskory have showed very apparent qualitative and quantitative differentiation for the last 10 years [Radwan *et al.* 1998, 2000, Chmielewski *et al.* 2005]. The pressure of numerous ravening water and mud birds is also important, all the more so as the Piskory reservoir is very shallow, and individuals of a majority of species are of a small size.

CONSLUSION

In wildlife reserve „Piskory” was found 7 fish species. Among them 1 strange species for native ichthyofauna – crucian carp was found. In all of study periods the dominance structure was different. In 2005–2006 years the dominating species was the sunbleak, in 2007 year the roach and 2008 year the perch. In the total fish biomass the roach, the pike and the perch were dominated. The number of fish species in reservoir „Piskory” has decreased for the last years. Great diversity in the structure of ichthyofauna, both during the study and in previous period, was probably associated with unstable hydrological and biocenotic conditions.

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STRUKTURA ICHTIOFAUNY W REZERWACIE PRZYRODY „PISKORY”

Streszczenie. Rezerwat przyrody „Piskory” został utworzony w 1998 r. w celu ochrony i zachowania zespołu ekosystemów wodnych, bagiennych i leśnych o dużej różnorodności biologicznej, ale ma on również nie mniej cenne zasoby walorów faunistycznych. W 2005 r. rozpoczęto badania mające na celu ocenę aktualnego stanu przyrodniczego oraz zmian, jakie zaszły w jeziorze Piskory po 10 latach od zakończenia projektu renaturalizacji. Jednym z elementów projektu była analiza struktury ichtiofauny. Badania ichtiobiologiczne w rezerwacie „Piskory” wykazały występowanie 8 gatunków ryb, należących do 4 rodzin. Skład gatunkowy ryb zarówno w poszczególnych latach, jak i sezonach badawczych był dość zróżnicowany. Najwięcej gatunków (6) stwierdzono jesienią 2006, zaś najmniej (2) w sezonie jesiennym w latach 2007–2008. W latach 2005–2006 we wszystkich stanowiskach badawczych najliczniej występowała słonecznica, natomiast dość licznie płoć i okoń. Z kolei w latach 2007–2008 najliczniej notowanymi gatunkami były płoć i okoń. W obydwu przedziałach czasowych pozostałe gatunki występowały bardzo nielicznie lub pojedynczo.

Słowa kluczowe: ichtiofauna, rezerwat przyrody, jezioro Piskory