

PRELIMINARY STUDIES ON THE OCCURRENCE
OF SWAMP-MINNOW *EUPALLASELLA PERENURUS* (PALLAS, 1814)
IN THE AQUATIC ECOSYSTEMS OF POLESIE LUBELSKIE (POLAND)^{* **}

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Abstract. High rate of degradation of the swamp-minnow *Eupallasella perenurus* habitats in the Polesie Lubelskie, Poland, as well as disappearance of some of the only few populations of this species known to exist there have been observed over recent decades. This fact was the basic premise justifying the beginning of studies on the actual state of the swamp-minnow populations in this area. In the present paper, preliminary results of these studies are presented.

Key words: swamp-minnow, occurrence, Polesie Lubelskie

INTRODUCTION

The swamp-minnow *Eupallasella perenurus* (Pallas, 1814), a cyprinid fish species under close protection in Poland since 1983, is currently considered to be critically endangered with extinction [11]. It was mentioned in the Treaty of Accession for the "Nature 2000" European Network as one of five priority vertebrate species, protection of which requires the establishment of Special Protection Areas [8,9,13].

Observed in the second half of the 20th century dramatic decline of the number of the Polish populations of swamp-minnow, noted also in the Polesie Lubelskie Region, and only fragmentary knowledge on the occurrence of this species in

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this part of Poland [1-7,10,12], were the main reasons for undertaking studies described in this paper.

The principal aim of the studies, planned for the years 2005-2008, is to assess the present state of the occurrence of the swamp-minnow populations in the region of Polesie Lubelskie. In the future, it will allow to create a definitive list of the most valuable – with respect to nature – priority localities, taking into account the practical possibilities of their protection.

MATERIAL, STUDY AREA AND METHODS

The studies were conducted in the spring and summer, 2005, in selected parts of Polesie Lubelskie. They covered 18 small water bodies of different origin (natural or man-made pools, peat bogs etc.), situated near the following villages: Zagłębcze, Sumin, Sosnowica, Kulik and Siedliszcze.

Swamp-minnow specimens were caught by dragging or with the use of the lift-method or using the modified one cage trap equipped with bait, made of material with a mesh size of ca. 0.5×0.5 cm. Fish were anaesthetised with 2-phenoxyethanol in the field, weighed to 0.1 g and measured (total length, 0.1 mm), then released.

Geographical situation of each water body was determined by means of a GPS hand receiver (Garmin GPSmap 60C), with an accuracy of 3-5 m. To calculate water surface, the length and width or diameter of each water body was measured using a laser telemeter (Bushnell YD Pro).

For some water bodies, measurements were carried out, in the field, of selected physical and chemical water parameters such as: electrolytic conductivity (Hanna Instruments conductivity detector), pH (Slandi SP300 pH-meter), and mineral compounds of nitrogen and phosphorus (Slandi photometer LF 205).

RESULTS

Physical and chemical water parameters

The physical and chemical characteristic of water of the particular study sites, where swamp-minnow populations were found, was differentiated, especially as concerns the values of electrolytic conductivity and pH. Considerably the lowest conductivity of $35 \mu\text{S cm}^{-1}$ was found for Jelino, whereas for all the remaining sites it was $217\text{-}579 \mu\text{S cm}^{-1}$. Jelino had also the lowest water pH of 5.22. For the remaining water bodies, pH ranged from close to neutral (7.05 in Sumin) to alkaline, with the maximum value of 8.14 found for Siedliszcze 1. The concentrations of mineral compounds of nitrogen and phosphorus were very low for all water bodies under study (Tab. 1).

Table 1. General characteristic of the study sites in Polesie Lubelskie with the occurrence of swamp-minnow populations

Study site	Geographical situation	Study site type	Number of water bodies		Depth (m)	Temperature (°C)	Electrolytic conductivity ($\mu\text{S cm}^{-1}$)	pH	$\text{NH}_4/\text{NH}_4^+$ (mg dm^{-3})	NO_2^- (mg dm^{-3})	NO_3^- (mg dm^{-3})	PO_4^{3-} (mg dm^{-3})
			Total water surface (ha)									
Janowica	N 51° 12' 57" E 23° 11' 10"	mid-forest	1	0.40	1.5	22.0	454	7.64	n.s.	n.s.	n.s.	n.s.
Jelino	N 51° 25' 29" E 23° 02' 14"	mid-peat bog	8	0.60	1.5	23.0	35	5.22	0.1	0.02	0.2	0.1
Kulik	N 51° 14' 56" E 23° 11' 03"	mid-meadow	1	0.18	n.s.	21.0	579	7.45	n.s.	n.s.	n.s.	n.s.
Siedliszcze 1	N 51° 11' 56" E 23° 09' 04"	mid-forest	3	0.50	1.5	23.0	459	8.14	0.2	0.02	0.5	0.1
Siedliszcze 2	N 51° 11' 53" E 23° 09' 18"	mid-field	1	0.40	1.5	21.0	380	7.59	n.s.	n.s.	n.s.	n.s.
Sumin	N 51° 22' 33" E 23° 10' 21"	mid-forest	2	0.54	1.0	22.5	217	7.05	0.1	0.02	0.5	0.1

n.s. - not studied.

Swamp-minnow occurrence

The swamp-minnow was found to occur in six study sites of different ecological character: Janowica, Jelino, Kulik, Siedliszcze 1, Siedliszcze 2, and Sumin. All of them are shallow and small water bodies, with water surface areas between 0.18 ha (Kulik) and 0.6 ha (Jelino); all are muddy and densely overgrown with aquatic vegetation (Tab. 1).

In Sumin and Kulik, no other than swamp-minnow ichthyofauna species were found. In the remaining study sites, swamp-minnow was accompanied by catfish *Ictalurus nebulosus* and tench *Tinca tinca* in Jelino, as well as crucian carp *Carassius carassius* and German carp *C. gibelio* in Siedliszcze 1 and Siedliszcze 2 (Tab. 2).

Table 2. Accompanying species of ichthyofauna in the water bodies inhabited by swamp-minnow

Study site	Species			
	Catfish	Tench	Crucian carp	German carp
Janowica			+	+
Jelino	+	+		
Kulik				
Siedliszcze 1			+	+
Siedliszcze 2			+	+
Sumin				

Swamp-minnow morphometry

Morphometric characteristics of swamp-minnow individuals from different habitats were highly differentiated. The highest individual body mass and total length values were found for specimens inhabiting the study sites at Janowica, Jelino and Kulik, whereas the lowest values were recorded for Siedliszcze 1 and Siedliszcze 2 (Tab. 3).

Table 3. Morphometric characteristic of swamp-minnow females and males caught in study sites in Polesie Lubelskie

Study site	Sex					
	Female			Male		
	n	Total length (mm)	Weight (g)	n	Total length (mm)	Weight (g)
Janowica	1	80.7	7.1	3	64.5 (57.8-70.5)	3.2 (2.1-4.2)
Jelino	13	80.6 (69.4-95.1)	6.0 (3.7-11.7)	11	89.9 (89.2-90.5)	7.4 (6.9-7.9)
Kulik	3	70.1 (65.1-72.0)	6.2 (3.8-10.1)	7	70.1 (60.0-76.0)	6.2 (3.8-10.1)
Siedliszcze 1	2	65.5 (61.0-71.0)	5.1 (5.0-9.2)	4	68.0 (55.0-72.0)	5.1 (5.0-9.2)
Siedliszcze 2	8	74.1 (59.6-80.0)	3.5 (1.9-6.1)	8	52.4 (41.3-75.2)	2.1 (0.6-4.3)
Sumin	13	67.1 (67.0-75.0)	5.7 (4.7-10.1)	4	59 (55.9-60.1)	5.7 (4.7-10.1)

n – number of specimens caught; data are given as means with range in brackets.

CONCLUSIONS

1. By the end of the 20th century, approximately 80 sites of the swamp-minnow were described for Poland, of which almost 50% were situated in the western part of Polesie Lubelskie. In 1998, the total number of the confirmed swamp-minnow stations was estimated at 22 in the whole country.

2. Swamp-minnow populations were found in only 6 out of 18 water bodies under study. With one station found earlier in Suchowola near Parczew.

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WSTĘPNE BADANIA NAD WYSTĘPOWANIEM STRZEBLI BŁOTNEJ
EUPALLASELLA PERENURUS (PALLAS, 1814)
W EKOSYSTEMACH WODNYCH POLESIA LUBELSKIEGO (POLSKA)

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Streszczenie. Badania prowadzono wiosną i latem 2005 roku w drobnych zbiornikach wodnych Polesia Lubelskiego. Objęto nimi 18 śródleśnych, śródpolnych i śródtorfowiskowych małych zbiorników znajdujących się w rejonie miejscowości: Zagłębcze, Sumin, Sosnowica, Kulik i Siedliszcze. Zbiorniki zasiedlone przez strzeblę błotną posiadały zróżnicowany charakter ekologiczny. Występowanie tego gatunku stwierdzono w pojedynczych lub tworzących w okresie niskiej wody większe kompleksy zbiornikach wodnych, stanowiących sześć odrębnych stanowisk: Jelino, Sumin, Kulik, Janowica, Siedliszcze 1 i Siedliszcze 2. Towarzyszącymi gatunkami w zespole ichtiofauny były sumik karłowaty *Ictalurus nebulosus* i lin *Tinca tinca*, karaś pospolity *Carassius carassius* i karaś srebrzysty *C. auratus gibelin*. Cechy morfometryczne poszczególnych osobników z różnych siedlisk wykazywały dość duże zróżnicowanie.

Słowa kluczowe: strzebla błotna, występowanie, Polesie Lubelskie