

Occurrence, threats, and the need for active protection of the lake minnow, *Eupallasella percnurus* (Pall.), in the Wielkopolskie Voivodeship in Poland

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Abstract. The present paper summarizes all available scientific data on the historical and current occurrence of the endangered cyprinid fish species lake minnow, *Eupallasella percnurus* (Pall.), in Wielkopolskie Voivodeship in Poland. In the twentieth century, only three or four sites were identified in this part of the country. Today, there is only one site in the voivodeship situated in the vicinity of Wolsztyn, which is classified as highly threatened and is subject to protection under the European Ecological Natura 2000 Network as PLH300028 “Barłożnia Wolsztyńska”. Although some findings of unknown sites of *E. percnurus* in Wielkopolska remain feasible, the prerequisite for the preservation of this species in this region is the urgent implementation of active protection measures. These should include an assessment of the present condition of the existing population, a partial deepening of the water bodies inhabited by this species, and searches for other water bodies nearby that are suitable for future introductions of wild or cultivated individuals in order to increase the number of existing populations.

Keywords: lake minnow, distribution, threats, conservation, Wielkopolskie Voivodeship (Poland)

The lake minnow, *Eupallasella percnurus* (Pall.) (family Cyprinidae), is of no economic importance but of exceptionally high ecological significance and protection status in Poland as one of the rarest and most endangered native freshwater fish species (Kusznierz

2001, Wolnicki 2004, Wolnicki and Radtke 2009). The species is considered as an especially important element of the Polish freshwater ichthyofauna and its biodiversity since it has retained its historical range of occurrence until today (Kusznierz et al. 2005).

The aim of the present work was to summarize published and unpublished scientific data on the past and present occurrence of *E. percnurus* in the area within the boundaries of today’s Wielkopolskie Voivodeship, including an assessment of threats to its existence and needs for protection.

According to published historical data, only three or four *E. percnurus* sites were noted in Wielkopolskie Voivodeship by the end of the twentieth century (Fig. 1). This number is considerably lower in comparison with all other areas of Polish territory within the range of occurrence of this species (Wolnicki and Sikorska 2009). The first report dates from 1910 when Schulz (1912) found a single *E. percnurus* site in Złotkowo, a village located to the north of Poznań. It was probably the same site that was found about 40 years later by Kaj (1953) who discovered *E. percnurus* in Złotkowo in two different water bodies. According to Kulmatycki (1920), *E. percnurus* was also present in a small peat pit located just several kilometers to the west of Złotkowo in the village of Kiekrz. However, Kaj (1953) did not confirm the existence of this location. The sites in the vicinity of Złotkowo were proved to be definitely extinct only in the late 1990s by Kusznierz

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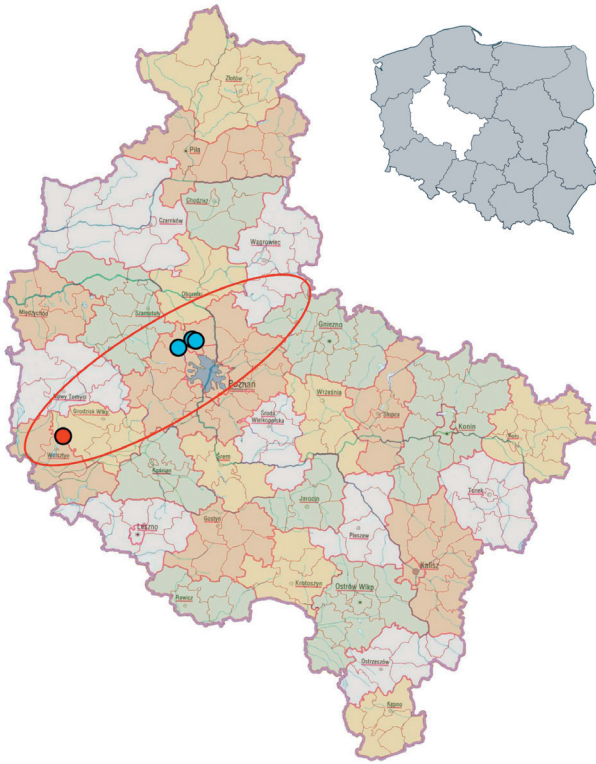


Figure 1. Past (blue circles) and present (red circles) distribution of *Eupallasella percunurus* sites in Wielkopolskie Voivodeship in Poland. The area where occurrence of this species is probable is circled with a red line.

(1995 and unpubl. data). The final find of an *E. percunurus* site in Wielkopolska was away from Poznań, when in 1992 its occurrence was recorded by Kuszniierz (1995) near the village of Barłożnia Wolsztyńska ($52^{\circ}10'31''$ N; $16^{\circ}07'47''$ E). Presently, this is classified as a Site of Community Importance (SCI) within the European Ecological Natura 2000 Network (PLH300028 “Barłożnia Wolsztyńska”). This protected area encompasses 22.02 ha of a peat meadow with a tight complex of two small, shallow peat-pits and several ditches surrounded by a pine forest.

Presently, the *E. percunurus* site located in Barłożnia Wolsztyńska is the only known existing site in Wielkopolskie Voivodeship. The site is considered to be highly threatened of extinction because of the permanent shallowing of the basins of all the water bodies and ditches there (Wolnicki and Radtke 2009, 2010). The local *E. percunurus* population inhabits acidic water with low nutrient contents (Kuszniierz

unpubl. data), so it is not likely to be large. It deserves to be preserved as it is the only one in the voivodeship, and because of its considerable isolation from other sites in the country. The implementation of active protection measures is indispensable.

It is widely recognized that the area of today's Wielkopolskie Voivodeship has never been subjected to large-scale or consistent inventory field studies aimed at identifying *E. percunurus* sites. However, despite the abundance of the local lake lands (Kondracki 2009), it seems unlikely that this part of Poland was ever an important sanctuary for this species. It should be underscored that over the last two centuries, surface waters have been gradually receding in this region (Kasprzak 1984). Only in the past one-hundred years, over 320 lakes of different sizes have disappeared in Wielkopolska (Kraska and Kaniecki 1995). Small water reservoirs that are typical of postglacial areas such as the Poznańskie Lakeland mesoregion have disappeared even faster than lakes. The area adjacent to Barłożnia Wielkopolska in Wielkopolskie Voivodeship has been affected by considerable decreases in groundwater levels in the past few decades. This, in turn, has resulted in considerable decreases in both the numbers and surface areas of many small water bodies (Juszczak and Kędziora 2003, Jankowiak and Kędziora 2009).

In consideration of this data, it is obvious that Wielkopolskie Voivodeship urgently needs a program of active *E. percunurus* protection, which should include similar methods as those successfully implemented in Mazowieckie Voivodeship (Wolnicki et al. 2011a). This type of program is a prerequisite for the preservation of this species in Wielkopolskie Voivodeship.

Since the main sources of water in the complex of reservoirs in Barłożnia Wolsztyńska are precipitation and surface run-off, the most urgent need is to deepen partially both peat-pits to help maintain their maximum depth at about 2 m. This will extend the existence of both the fish habitat and population. In fact, partial deepening the water bodies would provide dual benefits, namely the protection of *E. percunurus* habitats and the improvement of water retention, which is recommended for sustainable

development in regions with water deficits like Wielkopolska (Kędziora 2010). It should be stressed that to date only two such attempts were undertaken in Poland – one in Okuniew in Mazowieckie Voivodeship (Wolnicki et al. 2011a) and another in Łochocin in Kujawsko-Pomorskie Voivodeship (Wolnicki et al. 2011b). First, however, the size and the basic structure of the *E. percunurus* population should be assessed using the Lincoln-Petersen method (Wolnicki et al. 2008, Sikorska et al. 2011) together with genetic studies. The latter, aimed to evaluate both intra- and interpopulation genetic diversity, will be completed within the framework of Research Project No. N N304 324839. Knowledge of the population size and condition is necessary to answer the question of whether it is feasible to translocate part of the population into other local water bodies with better conditions for this species.

Although the area of today's Wielkopolskie Voivodeship has never been studied widely for *E. percunurus* occurrence, it is possible that existing, but as yet unknown, sites of this species could be found. The area extending from Barłóżnia Wolsztyńska through Poznań to Gniezno at the boundary of the voivodeship is especially promising (Fig. 1). This area, which constitutes a large part of the Wielkopolskie Lakeland macroregion, corresponds with the historical range of occurrence of this fish not only in Wielkopolska, but also in Kujawy (Wolnicki and Sikorska 2009).

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Streszczenie

Występowanie, zagrożenia i potrzeba aktywnej ochrony strzebli błotnej *Eupallasella percunurus* (Pall.) w województwie wielkopolskim w Polsce

Celem pracy było podsumowanie opublikowanych i niepublikowanych informacji na temat dawnego i obecnego występowania oraz ochrony zagrożonego wyginięciem gatunku ryby karpiowatej, strzebli błotnej *Eupallasella percunurus* (Pall.), w województwie wielkopolskim. Do końca ubiegłego wieku w opublikowanych i niepublikowanych źródłach naukowych wzmiankowano o 3 lub 4 wielkopolskich stanowiskach tej ryby, z których do dzisiaj przetrwało jedno zlokalizowane w okolicach Wolsztyna. Jest to mały kompleks kilku dawnych wyrobisk torfu, silnie wypłyconych, o ograniczonym okresie egzystencji. Obecnie stanowisko to jest specjalnym obszarem ochrony PLH300028 „Barłóżnia Wolsztyńska”, utworzonym w ramach Europejskiej Sieci Ekologicznej Natura 2000.

Utrzymanie obecności strzebli błotnej w Barłóżni Wolsztyńskiej, a więc i w całym województwie, wymaga pilnego podjęcia czynnych działań ochronnych. Powinny one doprowadzić do oceny wielkości i kondycji populacji z Barłóżni Wolsztyńskiej, gdyż część osobników z tej populacji mogłaby być użyta do zainicjowania nowych lokalnych populacji. Konieczne byłoby również pogłębienie tamtejszych torfianek oraz wytypowanie lokalnych zbiorników wodnych nadających się do introdukcji osobników tego gatunku. Pożądane byłoby również zbadanie, czy ryba ta nie występuje w korytarzu Wolsztyn-Poznań-Gniezno, gdzie odnalezienie jej nieznanymi stanowisk wydaje się prawdopodobne.