

An alarming picture of larval fish assemblages entrained into the cooling system of the Kozienice Power Plant (Poland) revealed by DNA metabarcoding



The annual entrainment of early life history stages of fishes (ELH) into the cooling system of the largest power plant in the Vistula River basin was assessed using passive capture techniques and DNA metabarcoding. Hydrological and thermal conditions during the 2022 breeding season were also analyzed. A total of 5,011 ELH individuals identified to four families and 23 species were recorded. ELH densities upstream of the power plant were an order of magnitude higher than they were downstream. Along with the phenology of occurrence and species composition of drift, this indicated very high (probably close to 100%) ELH mortality during passage through the cooling system. Taking into account low water discharge at constantly high water intake during the season, the absolute estimate of ELH individuals entrained into the cooling system was $> 103 \times 10^6$. The power plant entrains a notable proportion of one-quarter to one-half of the total ELH drifting by, especially during low-flow periods. Together with the very high abundance of two invasive Ponto-Caspian gobies, the magnitude of the entrainment of ELH into the Kozienice Power

Plant presents a truly alarming picture.

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