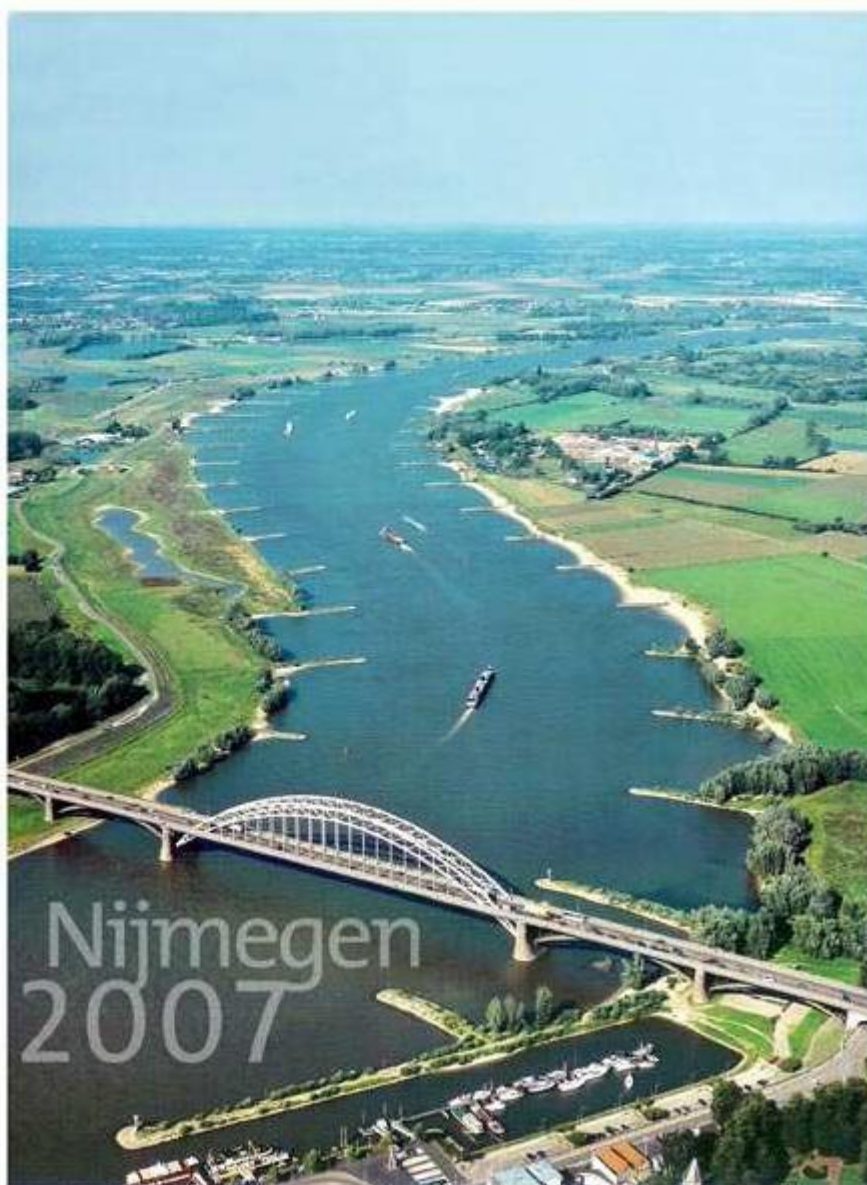


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## Modification in the Reproduction Strategy – Reason for the Round Goby (*Neogobius melanostomus*) Invasion Success in the Gulf of Gdańsk?

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Invasion by the round goby (*Neogobius melanostomus*), the Ponto-Caspian fish, has been observed in the Gulf of Gdańsk from 1990. Gobies were of small importance during the first few years of the invasion, but soon they became the dominant of the shallow water fish community. The invasion in this area involves a number of different species and a stable and complex ecosystem. This situation implies some important questions. How was such successful invasion possible? Are the invaders behaving the same in the native area and in the invaded region? We are trying to answer certain questions focusing on the spawning behavior and the reproduction effectiveness. The round goby spawns in waters of depth down to 20 metres, mostly in the shallowest areas. Males guard eggs attached to hard elements of the bottom. In the area of native occurrence, the Ponto-Caspian region, effectiveness of reproduction is correlated with sex ratio in the spawning population. When the number of females is greater than the number of males the effectiveness falls down. Nests are big, many females lay eggs into one nest (round gobies are multiple spawners). Guarding and ventilation of nests is difficult, and a lot of developing eggs die. In native areas, the numbers of males and females are mostly equal and spawning success is excessive. Males guard territory around the nest of about two-metres diameter. Reproduction takes place during all warm periods of the year. In the Gulf of Gdańsk, spawn typically prolongs from the middle of April to the end of September. The bottom in that area is sandy and the spawning places are limited. Eggs are attached to any solid element on the bottom. In suitable places, almost all hard elements on the bottom are used for nests. In such situations, distances from nests are shrink to the minimum. Often nests join one to another. Sometimes, large parts of hard elements are totally covered by fish eggs and it is impossible to separate specific nest. The highest number of nests is observed in the most inner, shallow water part of the Gulf. In that area, round goby eggs cover all suitable places. The other variation typical for the Gulf of Gdańsk population, correlated with reproduction, is domination of males in number. Currently, the observed sex ratio is two or three males to one female. The nests are small. Their guarding effectiveness is high. Both described factors result in the highest ever observed reproduction success. It promotes the successful invasion. Taking into account frequent invasions of the round goby in various European and North American regions, the presented phenomena may be employed for quick prediction of invasion potential in early stages of settlement. Domination of males in number results in high reproduction effectiveness and successful invasion.

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