

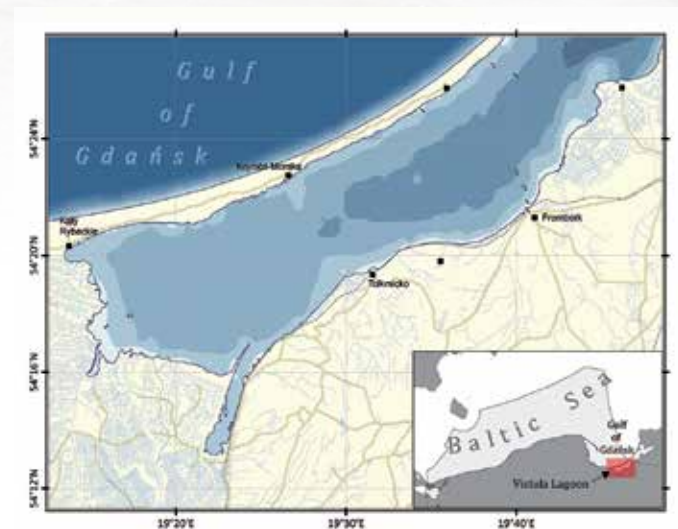


Coastal Case Study: Vistula Lagoon, Poland

While the entire Polish coastal zone is an important herring spawning area, Vistula Lagoon is an especially important site. Although the highest intensity fishing took place from 1983-1990 with 3,000-4,000 t annually, systematic and significant increases in landings from a low level of 500 t in 2008 to over 2,000 t in 2012 have been observed in the last few years. The lagoon is a partially-enclosed, shallow body of water at most 5 m deep. Water exchange between the sea and the lagoon occurs only through the Pilawa Strait located in the Russian part of the basin. Water temperatures, which are high in comparison to more open coastal waters, not only provide suitable spawning conditions but also support increased growth rates of herring larvae hatched in this area. Moreover, high productivity, which includes zooplankton, provides excellent feeding conditions for adult herring as well as larvae and juveniles. Interestingly, the intensity of spring herring spawning in the lagoon is high despite the unfavorable bottom structure, which is mostly sandy and muddy with a very limited area covered by plants with submersed leaves.

It is a widely-held opinion that herring spawning grounds in the Vistula Lagoon do not require any special protection. Consequently, only pikeperch and bream protected areas have been designated in it. Even though it seems there is little need to implement special protection for herring spawning grounds at present, such a cavalier approach could lead to overlooking potential risks to both effective spawning and egg and larva survival in the future. So, what precisely are the possible direct threats? *Damage to spawning grounds, pollutants levels that increase egg and larval mortality, and eutrophication that results in low oxygen levels and changes in bottom structure from sandy to muddy.*

Most of the human activities that could be responsible for such changes in the Vistula Lagoon area are currently practiced at either very low levels of intensity, for example fisheries, tourism, passenger and cargo transport, dredging, industry, urbanisation, or are non-existent in this region, such as mining and energy extraction. Tourism is most likely to increase in intensity, especially if the plan for building a channel through the Vistula Spit is executed. Still, increased tourism will probably not be intense enough to pose significant threats to the environment or herring spawning grounds.



Polish part of the Vistula Lagoon (© Lena Szymanek)

However, the most significant of all human activities impacting the lagoon is agriculture. Although nutrient concentrations have decreased in the lagoon considerably in recent years, especially with regard to phosphorus, the risk posed by increased intensity in agriculture on the drainage area cannot be ignored. This is especially true if the high internal potential for eutrophication and contamination of the lagoon is considered; the shallow depth of the lagoon facilitates bottom sediment resuspension, and restricted water exchange with the Gulf of Gdansk severely limits the ability of lagoon waters to self-purify.

Despite the low intensity of human activities impacting the Vistula Lagoon at present time, it is important to provide effective administrative supervision for the region. The challenges of doing so and possible improvements in this field are currently being analysed in the project HERRING.

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