RESTOCKING THE EASTERN BALTIC COD: IN SIGHT OR DISTANT?

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In 2004, we evaluated the potential for enhancing the Eastern Baltic cod stock based on the available biological, ecological, and fisheries information. The information showed that the severe decline in the Eastern Baltic cod stock was caused by a combination of overfishing and adverse environmental conditions. The latter conditions in ICES area 25 were related to the unique conditions of the eastern Baltic cod. This population has adapted to the low saline environment by producing eggs that are buoyant at around 11‰. The water masses in the Bornholm Basin, which is where this stock spawns consists of a surface salinity low saline (7‰) layer separated from the heavy bottom high saline (18‰) waters. The oxygen level in the halocline, where the fertilised eggs will occur, may at times be very low, and depends on inflow of fresh saltwater from the North Sea. The lack of saltwater influx in recent years has resulted in a restriction of the geographic area and spawning volume around the halocline for cod spawning to be successful and constitutes a severe bottleneck for egg survival and therefore for recruitment of this population.

The cod eggs and newly-hatched larvae are heavily predated upon by herring and sprat. However, once the larvae begin to feed, they will swim actively towards the upper layers in search for food and are here generally free from predators.

Furthermore, larval survival is also dependent upon the relationship between larval presence and the occurrence of dense patches of suitable food items. A 2-3 month delay in the spawning period as compared to 20-30 years ago has altered the feeding conditions for the first-feeding cod larvae both with respect to food species present and the spatial distribution of these species, creating a less favourable environment. Releasing fish larvae during early in the spring would mimic the spring spawning recorded in earlier times and utilise the copepod production which is still present during this period.

Three release scenarios were evaluated each aiming at a 10% increase in the average year-class of 2 year-old cod recruits from the Eastern Baltic, namely a) release of eggs, b) first-feeding larvae or c) cod juveniles. The results showed that releasing 474 million first-feeding larvae over a 5 month period was the only biologically and economically feasible choice.

The economic cost-benefit for the local fishermen using releases of first-feeding larvae was estimated to provide a yearly income of 1.7 million - 2.7 million € depending on the dispersal of the cod within the Baltic at a yearly cost of 270,000 € for rearing and releasing first-feeding larvae.