

Coastal Case Study: Greifswald Bay, Germany

The German case study area of Greifswald Bay (GWB) is a semi-enclosed inner coastal water, formed by the mainland of Mecklenburg-Western Pomerania and the island of Rügen. GWB covers an area of approximately 514 km² and is characterised by a mean depth of 5.8 m with a maximum depth of 13.6 m.

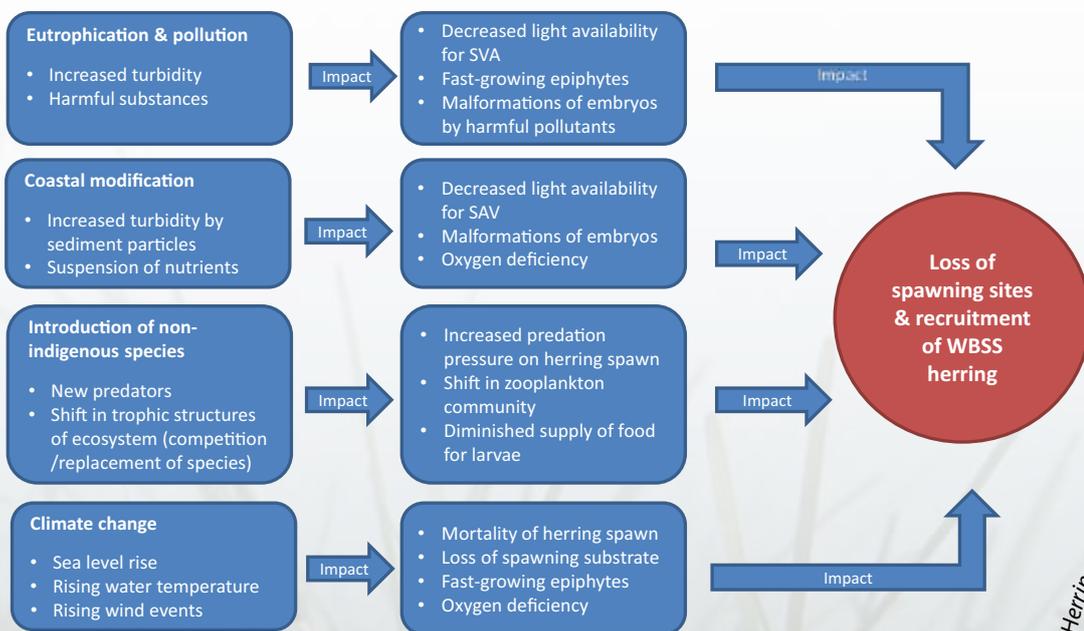
GWB is considered the main spawning area of western Baltic spring spawning herring (WBSS), which is also an important target species of the commercial fisheries in this region. In recent years, catches and spawning stock biomass of WBSS herring have declined. Moreover, despite a sufficient number of spawners, recruitment has declined considerably within the last decade, while reasons for this alarming decrease remain unknown. At the same time, human use and spatial demands (for example nutrient and pollutant loads, dredging of fairways, and beach nourishment) in GWB are increasing. Consequently, anthropogenic impacts are changing the physical and biological environment, affecting the success of egg development and spawning habitat.

During the spawning season from March through May herring migrates into the coastal waters to attach its eggs to submerged macrophytes in the shallow littoral zone. It is assumed that there is natal homing in population of WBSS herring, highlighting the importance of individual and small-scale spawning sites for the overall population.

This combined with the fact that the importance of individual sites for the recruitment success varies between years implies that a precautionary approach to coastal spawning ground management is needed. Although total mean nitrogen and phosphate concentrations decreased in previous decades, eutrophication levels are still above suggested thresholds. In addition, at the same time aquatic submerged vegetation has declined dramatically from 90 % to 15 %.

Linking the ecological function of herring spawning sites to existing coastal and fishery management regulations has been one of the main tasks within the HERRING project. During a stakeholder workshop a priority setting revealed 'eutrophication' as one of the main problems impacting GWB. However, stakeholders' interests are quite distinct when it comes to protection and usage of spawning sites. Future spawning ground management should aim to preserve or improve the ecological status quo, and to include the ecological function of submerged aquatic vegetation in existing environmental and management regulations. To achieve effective management, relevant stakeholders need to be involved in the process.

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Overview of multiple impacts of anthropogenic stressors on herring spawning habitat. Source: TI-OF

