

Project *brief*

Thünen Institute of Sea Fisheries

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Why self-management of the North Sea shrimp fishery needs to be improved

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- The German fishery for North Sea shrimp (*Crangon crangon*) is MSC-certified but is not subject to an EU management plan; instead, it operates under an internal self-management scheme.
- The assessments for this date back to the 1970s and urgently need to be updated in order to prevent overfishing.
- The CRANMAN project provides the necessary biological and fishery research data for this purpose.
- Fishermen, as the affected professional group, must be involved in the necessary decision-making processes.

Background and Objectives

The shrimp fishery is an important fishery in Germany and is not subject to an EU management plan. The scientific assessment for this fishery is based on research from the 1970s. More recent research, however, calls this assessment into question, which is why the need for an EU management plan is being reconsidered. Since 2017, the German shrimp fishery has held a sustainability certification (Marine Stewardship Council, MSC). Unlike other fisheries governed by an EU management plan, the MSC certification for the shrimp fishery is based on internal self-management.

The CRANMAN project provides the scientific basis to support and improve this self-management. Additionally, on the marketing side, wholesale traders increasingly require certification of the various fisheries. A central prerequisite for this is the availability of scientific stock assessments and management recommendations for the target species.

Since such assessments do not exist for the shrimp fishery, the first step was to establish self-management by the fishery itself. Due to the short lifespan of the North Sea shrimp (*Crangon crangon*), monthly monitoring of the stock is necessary to implement regulatory measures immediately within the ongoing season. This can best be carried out and organized by the fishery itself.

Current effort-regulating measures under fishery selfmanagement primarily include a fishing stop during periods of low stock abundance and the gradual increase of mesh sizes. The research conducted in the CRANMAN project aims to scientifically investigate and improve the effectiveness and efficiency of this self-management.

Approach

- Analysis and standardization of fishing effort and distribution from logbooks and Vessel Monitoring System (VMS) data
- Monitoring and improvement of effort-reduction measures
- Studies on density-dependent growth limitation of North Sea shrimp

- Monitoring and analysis of bycatch of non-target species and development of measures to further reduce unwanted bycatch ("Tiews series")
- Development of concepts for a standardized survey using commercial cutters
- Evaluation of self-management in the shrimp fishery and comparison with previous experience and scientific studies on successful self-management concepts
- Surveys of fishermen regarding the acceptance of different management measures and expectations of the management system

Results

A combined analysis of VMS data from the Netherlands, Germany, and Denmark showed a 12% increase in fishing effort between 2009 and 2018, despite declining landings. In particular, unit catches in the first quarter, especially in northern areas, have been decreasing continuously over the past 10 years. There is evidence of a negative effect of winter fishing in southern areas on stock densities in the following summer/autumn in northern areas, indicating potential recruitment overfishing, as well as previously unknown spatial connections among sub-populations.

The currently applicable rules on discard limits for quota species (*de minimis*) were historically evaluated using the "Tiews series" (Tiews, 1990a; Tiews, 1990b). The required discard limit of 6% (EU COM Delegated Regulation 2018/2035) was exceeded in some years for plaice, sole, and whiting, whereas for cod and herring it always remained below 6% of the quota.

A comparison of the Demersal Young Fish Survey (DYFS), conducted annually in the German coastal waters of the North Sea to assess the stock of juvenile cohorts of commercial fish species, with the Tiews series from 1975 to 1993 was used to evaluate the self-sampling program (ICES, 2003), to which the shrimp fishery is committed under the current *de minimis* regulation. Despite differences in sampling strategies, both time series showed largely similar bycatch species composition, but differing abundance trends.

A non-metric multidimensional scaling (nMDS) analysis of the historical Tiews bycatch time series revealed variations in bycatch composition across different time periods. Bycatch quantities also varied, with particularly high amounts in the 1960s and lower amounts in the 1970s. (Abbildung 1).

Conclusions

Measures to reduce growth overfishing remain necessary. A further increase in mesh size to 26 mm would still be an effective measure. As an alternative to increasing mesh size, a reduction in fishing effort during the summer months could be considered.

Additional measures to reduce discard mortality could include shorter hauling and processing times, as well as optimization of catch sorting. Based on the analysis of the Tiews series, management measures to reduce bycatch would be most effective in autumn (September to November).

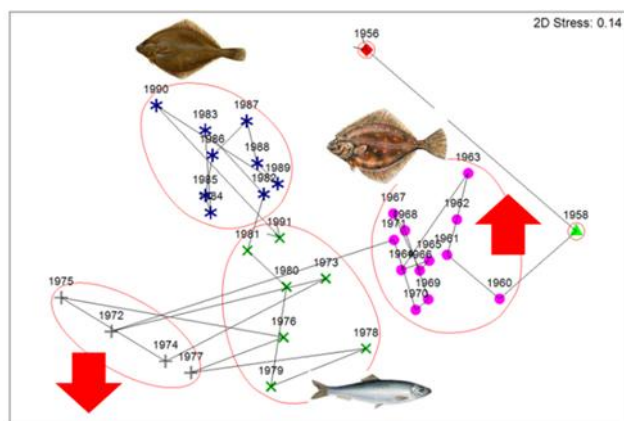


Figure 1: Results of multidimensional scaling (nMDS) with Tiews data for the years 1956 to 1991. Significant periods are outlined in red. The red arrows indicate high or low bycatch. Fish characterising the periods are plaice (top right), sprat (bottom) and dab (top left) – (Source: own presentation).

The current form of the Harvest Control Rule (HCR) cannot effectively prevent further increases in fishing effort during periods and in areas with low shrimp stocks. This is particularly the case in winter months, as the reference values derived from German fleet data are not representative for this period. Even if the fishermen in the survey largely reject regionalisation of the HCR, from a scientific point of view it would be expedient for better resource management. Moreover, the current regulation allows for additional increases in effort despite the implementation of HCR restrictions. Therefore, in addition to revising the reference values, strict control of actual fishing effort is necessary.

Changes to management should be developed jointly with fishermen on as broad a basis as possible. Many fishermen feel underrepresented in the decision-making process and wish to be more actively involved.

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Further Information

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Publications

Respondek G, Günther C, Beier U, Bleeker K, Pedersen EM, Schulze T, Temming T. 2022. Connectivity of local sub-stocks of Crangon crangon in the North Sea and the risk of local recruitment overfishing. Journal of Sea Research, Volume 181 (102173)
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