Evaluation of marine subareas of Europe using life history parameters and trophic levels of selected fish populations

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ABSTRACT

European marine waters include four regional seas that provide valuable ecosystem services to humans, including fish and other seafood. However, these marine environments are threatened by pressures from multiple anthropogenic activities and climate change. The European Marine Strategy Framework Directive (MSFD) was adopted in 2008 to achieve good environmental status (GEnS) in European Seas by year 2020, using an Ecosystem Approach. GEnS is to be assessed using 11 descriptors and up to 56 indicators. In the present analysis two descriptors namely "commercially exploited fish and shellfish populations" and "food webs" were used to evaluate the status of subareas of FAO 27 area. Data on life history parameters, trophic levels and fisheries related data of cod, haddock, saithe, herring, plaice, whiting, hake and sprat were obtained from the FishBase online database and advisory reports of International Council for the Exploration of the Sea (ICES). Subareas inhabited by r and K strategists were identified using interrelationships of life history parameters of commercially important fish stocks. Mean trophic level (MTL) of fish community each subarea was calculated and subareas with species of high and low trophic level were identified. The Fish in Balance (FiB) index was computed for each subarea and recent trends of FiB indices were analysed. The overall environmental status of each subarea was evaluated considering life history trends, MTL and FiB Index. The analysis showed that subareas I, II, V, VIII and IX were assessed as "good" whereas subareas III, IV, VI and VII were assessed as "poor". The subareas assessed as "good" were subject to lower environmental pressures, (less fishing pressure, less eutrophication and more water circulation), while the areas with "poor" environment experienced excessive fishing pressure, eutrophication and disturbed seabed. The evaluation was based on two qualitative descriptors ("commercially exploited fish and shellfish populations" and "food webs") is therefore more robust.