

EcoQO on proportion of large fish in the (demersal) fish community

Background

“Fish communities” has been one of the issues considered when developing the EcoQO system for the North Sea. In 2005 the OSPAR report on the North Sea Pilot Project on EcoQOs concluded that the EcoQ element “proportion of large fish” could be meaningful, but that considerable further development work was needed on the metrics “mean weight” and “mean maximum length of fish”. OSPAR 2005 consequently agreed that the 2006 ICES Work Programme should include a request for ICES to carry out further development work on the EcoQO changes in the proportion of large fish and hence the average weight and average maximum length of the fish community.

In response to the OSPAR 2005 request, ICES in 2006 suggested that the goal for the North Sea fish community should be:

- a. to halt as rapidly as possible, and begin to reverse by 2010, both the decline in the mean weight; and
- b. the decline in the proportion of large fish;
- c. and that the short-term operational targets should be:
 - Based on survey catches: Halt the decline in the proportion of fish greater than 30 cm in length as rapidly as possible.
 - Based on survey estimates: Halt the decline in the mean weight of fish as rapidly as possible.

ICES continued work on this EcoQO in 2007, and determined that the metrics in the form proposed by ICES in 2006 are clearly sensitive to environment-related variations, and trends due to high fishing pressure may be lost or obscured. Based on its work in 2007 ICES therefore recommended:

- the EcoQO for restoration/conservation of the size-structure of the fish community of the North Sea should be: The proportion (by weight) of fish greater than 40 cm in length should be greater than 0.3, based on the ICES Q1 IBTS survey series.
- no EcoQO needs to be set for the Mean Weight of Fish metric in the North Sea.

The metric for the EcoQO (proportion of fish greater than 40 cm) should be calculated for the demersal part of the fish community as sampled in the IBTS survey, excluding the catch of pelagic species like herring, sprat and sandeel.

While the metric for mean weight of fish is not needed as a basis for an EcoQO, ICES recommended that it should still be retained as a supplementary metric that reflects important fish community properties such as recruitment events.

Has the EcoQO been met?

The EcoQO is not met. From the early 1980s, the percentage of demersal fish in the North Sea greater than 40 cm fell from around 30% to its lowest point of less than 5% in 2001. The percentage has subsequently recovered to around 22% in 2008 (figure 7.1). This is an improvement although there is still some way to go to meet the objective.

ICES plans to continue work on the 'Proportion of Large Fish' metric, and will then concentrate on the connection between management action and the time scale required to achieve the target value of 0.3 for this EcoQO metric.

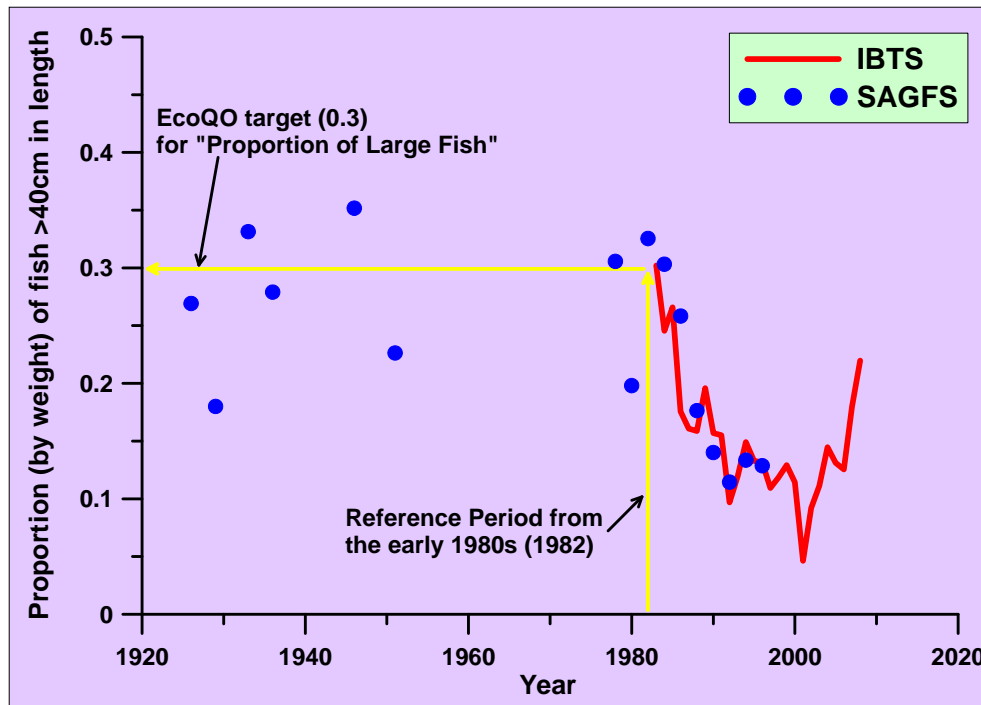


Figure 7.1: Plot showing the Scottish Autumn Groundfish Survey (SAGFS) aggregated year group data (circles, with unfilled circles indicating two outliers related to strong year classes of gadoids). Variation in the IBTS data set is shown (solid red line). 1982 was considered to represent the "early 1980's" reference period and derivation of 0.3 as the target value for the metric is illustrated. (OSPAR, 2009)

Use of the EcoQO

This is a target type EcoQO. There is not as yet a reference level for the pristine state (no fishing), although possibly such a reference could be developed through theoretical modelling. However, a practical reference exists as the early part of the time series for which this metric is constructed. This is also the target value for the EcoQO suggested by ICES (value 30% for the proportion of large fish).

The use of this EcoQO is the responsibility of the competent fisheries management authorities, which are the EU and Norway. OSPAR has no competence to adopt programmes and measures on questions related to the management of fisheries.

The metric for this EcoQO is tied to the ICES IBTS Survey for the 1st quarter. As advised by ICES, this is the only existing survey considered suitable for monitoring changes in the proportion of large fish in the North Sea fish community. This time series needs to be consolidated and if necessary improved to provide the data needed to use this EcoQO.

To develop specific management measures to move the metric from current levels towards the advised EcoQO target, additional modelling is required. In its advice, ICES stresses that progress towards the target requires, as a minimum, a reduction in fishing mortality to below F_{pa} . However, until the appropriate modelling is undertaken, it is not possible to say with any confidence what level of fishing mortality is likely to result in achieving targets for the large fish metric within given time frames.

ICES should be requested to continue work to consider and advise on management measures that could be taken to achieve this EcoQO.

Relation to Ecosystem Approach and the MSFD

The set of EcoQOs for the North Sea was developed with the aim to being an integral part of the Ecosystem Approach (EA) to the management of the North Sea, contributing to the objectives part of the EA. As such it is particularly important, as it can contribute to the further integration of fisheries and environmental protection, conservation and management measures, as called for in the Statement of Conclusions from the Intermediate Ministerial Meeting on the Integration of Fisheries and Environmental Issues in Bergen in March 1997.

The MSFD includes fisheries related issues as part of the definition of GES *i.e.* GES descriptors (1), (3) and (4)

- (1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
- (3) Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
- (4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.

The EcoQO on proportions of large fish can therefore have an important supplementary role to the MSFD by covering a key aspect of fisheries in relation to the overall objective of achieving good environmental status. However, measures concerning fisheries would appear to lie outside the scope of the Directive as the competence for fisheries management has been given to the European Commission.

Applicability of the EcoQO in other OSPAR Regions

The analysis presented to identify the most appropriate length threshold for defining a large fish is specific to the North Sea. The threshold of 40 cm may be entirely inappropriate for fish communities resident in other marine regions and subject to different fisheries regimes and environmental conditions. If a similar metric is required for other fish communities, then an analytical procedure similar to the one followed here will be needed to identify appropriate length thresholds.

References

- ICES (2007a). Report of the Working Group on Fish Ecology (WGFE). ICES CM 2007/LRC:03.
- ICES (2007b). Report on the Working Group on Ecosystem Effects of Fishing Activities (WGECO). ICES CM 2007/ACE:04.
- ICES (2007c). Report of the ICES Advisory Committee on Fishery Management, Advisory Committee on the Marine Environment and Advisory Committee on Ecosystems, 2007. ICES Advice. Book 1 (Books 1 - 10. 1,333 pp.)
- OSPAR (2009). Assessment of the environmental impact of fishing. Publication No. 2009/465.

↪ [Go to full QSR assessment report on the evaluation of the OSPAR system of Ecological Quality Objectives for the North Sea \(publication number 406/2009 \(update 2010\)\)](#)