ECOREGION   **Widely distributed and migratory stocks**
SUBJECT   **NEAFC request on effects on assessments of historical unaccounted landings for mackerel and the utility of new and existing surveys**

Request

"The Coastal States refer to the ICES advice on Northeast Atlantic mackerel for 2013 where it states that "Unreported catches in the time-series cause underestimation of stock size in the analytical assessment, which is the basis of the scientific advice. The level of misreporting may have changed over time. This will remain a problem for future years, as the model cannot compensate for an unknown level of historical unreported catches." (ICES Advice 2012, Book 9, pg. 9).

Based on this:

1. *ICES is requested to explore and evaluate the sensitivity of the current assessment to past uncertainties in the estimates of removals.*
2. *In anticipation of the 2014 benchmark assessment, ICES is further requested to advise on the utility of existing surveys for other stocks to derive tuning indices for the mackerel assessment, or how existing mackerel surveys should be extended or improved. Furthermore, ICES is asked to advise on the need for other fisheries-independent indices with the aim of improving the assessment.*

Advice

WGWIDE carried out a thorough analysis of the potential levels of underreporting over time and the sensitivity of the assessment to this uncertainty (Annex 3 in ICES, 2013c). The assessment showed sensitivity to such uncertainty, resulting in higher biomass with higher historical catch estimates. ICES decided to reject the assessment as a basis for advice.

As a consequence, the advice is now based on the on recent landings, but this advice is seen as a temporary interim measure. ICES will attempt to incorporate more stock size information in an appropriate assessment model at the benchmark in 2014. Should this approach be unsuccessful a DLS approach will be developed based specifically on the triennial regime of survey data.

The upcoming benchmark (WKPELA 2014) will explore alternative modelling approaches that can better deal with catch uncertainty. The work done by WGWIDE (ICES, 2013c) and knowledge gained should be considered during the benchmark process.

In preparation for the 2014 benchmark assessment an issue list has been compiled, listing the types of tuning indices that could provide information from surveys that would be useful for consideration in the benchmark. The potential survey indices are:

- SSB index from existing egg survey time-series
- Potential recruitment indices from:
    1. IBTS Q1 surveys in the eastern Atlantic
    2. IBTS Q4 surveys in the eastern Atlantic
    3. The IESSNS
- Age-structured adult indices from:
    1. IBTS Q1 surveys in the eastern Atlantic
    2. IBTS Q4 surveys in the eastern Atlantic
    3. The IESSNS
    4. Acoustic survey indices from various surveys
    5. Larvae index from CPR surveys
    6. Tagging surveys (with recovery from the commercial fisheries)

Of these existing survey series, only the egg survey is presently used in the assessment. Some of the other indices have been evaluated, and either been rejected because they do not perform adequately (within the scope of the current assessment model), or they are relatively new and the ICES process is to include new information only at the benchmarking process which has not occurred yet.

In February 2013 the Workshop on Northeast Atlantic Mackerel monitoring and methodologies including science and industry involvement (WKNAMMM) was convened to assess potential contributions of fisheries to data collection for NEA to evaluate new survey methodologies for NEA mackerel. Table 2 in the WKNAMMM report (ICES, 2013b) provided an overview of some mackerel-related surveys including methodology used, time, frequency, years, area, applicability to assessment, challenges, and potential use in the assessment for mackerel. An ICES survey methodology workshop (WGISDAA) has reviewed the IESSNS survey and provided recommendations which need to be addressed in order to create a potential stock index from this survey.

ICES advises that there is a need for a reliable age-structured fisheries-independent index for NEA mackerel stock assessment. Such an index should facilitate tracking of the relative abundance of year classes over time with acceptable accuracy and precision. ICES notes that a time-series of at least five years would be required for this index to contribute meaningfully to an age-based assessment. Three such potential indices are currently available.

The utility of all of the survey indices listed above to the mackerel assessment will be (re-)evaluated at the 2014 benchmark workshop. It is not possible to say which of these surveys will be included in the benchmarked assessment in advance of that process.

Sources

ICES. 2013a. Report of the *Ad hoc* Group on the Distribution and Migration of Northeast Atlantic Mackerel (AGDMM). ICES CM 2013/ACOM:58. 215 pp.

ICES. 2013b. Report of the Workshop on Northeast Atlantic Mackerel monitoring and methodologies including science and industry involvement (WKNAMMM). ICES CM 2013/SSGESST:18. 37pp.

ICES. 2013c. Report of the Working Group on Widely Distributed Stocks (WGWIDE), 27 August–02 September 2013, ICES Headquarters, Copenhagen. ICES CM 2013/ACOM:15.

ICES. (In press). Improving the Use of Survey Data for Assessment and Advice (WGISDAA).