REPORT OF NAFO SCIENTIFIC COUNCIL IN 2002

Fernando González

Instituto Español de Oceanografia Centro Oceanográfico de Vigo Apartado 1552, 36200 Vigo fernando.gonzalez@vi.ieo.es

This Report presents the discussions about the stocks of *Sebastes mentella* in the North Atlantic that took place in the 2002 Scientific Council of NAFO. Scientific Council was provided a report on the deliberations of the ICES North-Western Working Group (NWWG) meeting that took place from April 28 to May 8, 2002 in Copenhagen as it pertains to stock structure, distribution and state of pelagic Sebastes mentella in ICES Sub-areas V, XII and XIV and the NAFO Convention area.

In this meeting there were three topics related to Sebastes mentella:

- 1 A question of the Fisheries Commission.
- 2 The new information on the stock structure.
- 3- The state of the stock carried out by the ACFM.

1- The Fisheries Commission requested:

"Regarding pelagic S. mentella redfish in NAFO Subareas 1-3 Scientific Council is requested to review the most recent information on the distribution of this resource, as well as on the affinity of this stock to the pelagic redfish resource found in the ICES Sub-area XII, parts of SA Va and XIV and to the shelf stocks of redfish found in ICES Sub-areas V, VI and XIV, and NAFO Subareas 1-3."

The Council responded as follows:

At its September 2001 Meeting, Scientific Council reviewed the most recent information available on the distribution of pelagic S. mentella based on the July 2001 international acoustic survey (SCR Doc. 01/161). The Scientific Council's conclusions on this subject can be found in NAFO Sci. Coun. Rep., 2001, pages 211-212.

Scientific Council noted that the issue of possible relationships between pelagic Sebastes mentella and demersal Sebastes mentella in the NAFO area has not been considered by the ICES Working Group.

Scientific Council concludes that the recent report of the ICES North-Western Working Group presents the best available summary of knowledge about the distribution of pelagic Sebastes mentella and its affinity to the shelf stocks in the relevant ICES area. Possible relationships between pelagic Sebastes mentella and shelf Sebastes mentella (demersal) have not been studied in the NAFO area, and no data adequate to address this question exist. No national funds have been committed to this research area at present. Additional funding for specific research studies would be needed in order to address this topic.

2 - The new information on the stock structure.

New information was presented on the general issue of stock structure within this whole area. The genetic structure of the pelagic and demersal stocks of deep-sea redfish (S. mentella) in the North Atlantic remains poorly known, but further research is currently being carried out. However, Scientific Council agreed with the NWWG that, based on the data available, all information suggests that the fishery for pelagic S. mentella in the NAFO Convention Area (eastern part of Div. 1F, 2H and 2J) is based on the same stock as fished in western part of ICES Sub-area XII.

3- The state of the stock

In the 2001 trawl-acoustic survey, as well as in that of 1999, the stock shallower than 500 m was observed more southwesterly and deeper than it has been during former acoustic surveys in the last decade. During the same period, a gradual increase in temperature in the observation area has been observed. This may have influenced the distribution pattern of the redfish in June-July as the highest concentrations were found in the colder, i.e. southwestern part of the survey area. In June/July 2001, about half of the total acoustically estimated stock biomass was found in the NAFO Convention Area shallower than 500 m omitting the Canadian EEZ. Scientific Council noted that the surveys in 1999 and 2001 extended further to the south and west into the NAFO Convention Area and this may in past account for the perception of greater distribution to the west.

Since 1994, acoustic estimates of stock biomass show a drastic decreasing trend. The estimate was only 0.7 million tons in 2001, compared with 2.2 and 1.6 and 0.6 million tons in 1994, 1996 and 1999, respectively. This represents a reduction of about 1.5 million tons in the period. During the same period, the total catch has been about 800 000 tons. Therefore, the catch alone cannot explain the changes in the stock estimate. During the same period, the fishery has also developed towards greater depth and towards bigger fish, and in recent years, the majority of the catch has been caught at depths deeper than 500 m. Based on these results, the NWWG concluded that acoustic estimates cannot be considered accurate measures of relative changes in stock size of the upper layer fish, as availability may have changed during the surveyed period. Information suggests that fish inhabiting the upper layer may have migrated out of the surveyed area, both horizontally and vertically (deeper). Scientific Council agreed with this evaluation.

In addition to the acoustic measurements, an attempt was made to estimate the redfish in and below the deep scattering layer. This was done by correlating catches and acoustic values at depths between 100 and 450 m. The obtained correlation was used to convert the trawl data at greater depths to acoustic values and subsequently to an abundance and biomass estimate. Standardized trawl hauls were carried out at different depth intervals, evenly distributed over the survey area. Data for the correlation calculations between trawl catches and the acoustic results were obtained during trawling only. In addition, scrutinized acoustic values were only taken from exactly the same position and depth range as covered by the trawl. Using this method, a total of approximately 1 075 000 tons were estimated to be at depths between 0 and 500 m. and about 1 056 000 tons below 500 m. In June/July 2001, one third of the biomass obtained with the trawl method of about 2 million tons was found in the NAFO Convention Area outside the Canadian EEZ. The NWWG considered that the low correlation between catch and the acoustic values used for abundance estimation and the assumption that catchability of the trawl is the same, regardless of the trawling depth, make the method questionable. Estimates based on these calculations both above and below 500 m depth, must be considered as a very rough measure with high uncertainty as the applicability of the method can only be verified after replicate measurements. The NWWG considered that the estimated abundance derived from the trawl data should be treated with great caution and they cannot be combined with the acoustic results. Scientific Council agreed with this evaluation.

The trend in unstandardized CPUE from different fleets in depths shallower than 500 m indicates a steep downward trend since 1995, and the trend in acoustic estimates from the surveys (described below) track these changes. In recent years, there is no clear signal in CPUE, but it should be noted that CPUE decreased between 2000 to 2001 for most indices, both shallower and deeper than 500 m. The results of a standardized CPUE analysis, derived from a GLM CPUE model incorporating data from Germany (1995-2001), Iceland (1995-2001), Greenland (1999-2001) and Norway (1995-2001) were available. The model takes into account year, month, vessel and area (ICES statistical square).

The model shows that the index did decrease until 1997 and increased thereafter until 2000 and decreased by about 15% in 2001. Given the technical, seasonal, geographical and depth changes of the fishing activities, the NWWG considered that the relevance of the unstandardized national CPUE series as indicator of stock abundance remains difficult to assess. However, from the standardised CPUE series, the NWWG stated that it can be concluded that the pelagic redfish CPUE remained stable since 1995 for all fishing areas as well as separated above and below 500 m depth. The models do not indicate significant stock reductions since 1995. Scientific Council considered that CPUE (standardized or not) in hours fished for redfish can be misleading and may be optimistic. Scientific Council does not consider this a reliable indicator of stock status since redfish exhibit schooling behavior and relatively good catch rates may still be possible while the area of the distribution of the resource is declining or number of schools is diminishing.

The decline in the acoustic survey time series estimates has been the basis for the advice in past assessments. The assessment of the current state of the stock and basis of the advice is based on trends in standardized CPUE indices and a trawl biomass estimator that is based on an approach that is highly uncertain. The NWWG concluded that taking into account the uncertainty in stock indicators, it is not known if the exploitation rate generated by recent catches is above or below the 5% exploitation rate.

In summary, Scientific Council concluded that a stronger statement should be made about the uncertainty in the stock status of pelagic S. mentella resource in ICES Sub-areas V, XII and XIV and the NAFO Convention Area, particularly for the considerations that the standardized CPUE series do not indicate significant stock reductions since 1995.