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Report of the 2008 session of the Joint EIFAC/ICES Working Group on Eels

Leuven, Belgium, 3–9 September 2008

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Abstract

Available information on recruitment, stock and fisheries continues to support and reinforce the advice that the European eel stock has declined in most of the distribution area and is outside safe biological limits. Recruitment of glass eel to the continental stock continues to decline with no obvious sign of recovery. Current levels of anthropogenic mortality are not sustainable and there is an urgent need that these should be reduced to as close to zero as possible, as soon as possible. All glass eel recruitment series demonstrate a clear decline since about 1980 with no sign of recovery. The Baltic indices of young yellow eel recruitment demonstrate a clear decline since about 1950. The decline in recruitment appeared stronger in the more northern and southern parts of the distribution.

In the 1970s, recruitment of glass eel was still at historically high levels indicating that Spawning Stock Biomass was not limiting the production of recruits at that time. Quantifying the 1970s spawner escapement therefore is the simplest derivation of a restoration threshold. The reference threshold should be set at 100% of the 1970s silver eel escapement where data are available, or in the absence of data, at a percentage (40%) of the notional pristine state which would have existed if no anthropogenic mortalities had impacted on the stock.

It is of utmost importance that existing recruitment monitoring is continued and improved, easing the dependence on commercial fisheries, and extended where inadequate. A radical improvement in the assessment of the current state of the stock, including quantification of the impact of anthropogenic mortalities, is urgently needed. Although comprehensive datasets exist in some river basins, this assessment will not be achievable in most river basins from currently limited data. Data discontinuities are likely to occur simultaneously and unlike in the past, statistical modelling will not be able to correct for this.

The first post-evaluation of the EU Regulation is required by mid-2012. Timely development of stock-wide assessment procedures is required, geared to the data becoming available, while indicating the progress towards recovery of the stock. The absence of any internationally driven requirement to maintain a recruitment dataseries needs to be corrected, with reference to the recommendations of the EU contract 98/076: Establishment of a recruit monitoring system for glass eel. The current legislative instruments including the Eel Regulation, DCR, CITES and WFD do not, either individually on in combination, contain sufficient provisions to ensure adequate data supply for such assessments.

It is suggested that managers define interim targets for the management measures in order to integrate local action efficiently to the aim of long-term recovery of the European eel stock. For this purpose sub-targets defining the magnitude of management measures will be linked with eel sub-targets reflecting the expected short-term response of the local eel population. Eel sub-targets should therefore allow a fairly rapid evaluation of the management measures taken but sensitivity and time response of some of the proposed eel sub-targets would need further investigation before their application would be operational. Eel sub-targets should finally be integrated into the evaluation of the status of the whole eel stock. However it has to be recognized that adequate methods, or modelling approaches, for achieving this are still lacking.

There are few quantitative estimates of pristine (pre-1980) and current silver eel production (Regulation EU 1100/2007) to allow comparisons to be made between systems

and there is few data on the importance of estuarine and coastal populations to overall production. Modelling will be needed to transfer estimates from data rich to data poor systems. Some approaches have been outlined by this Working Group which compliment those presented in previous working groups and in EU SLIME (Dekker *et al.*, 2006).

Implementation of EMPs requires the development of methods to obtain silver eel escapement data. They can include either direct (e.g. mark-recapture) or indirect measures (yellow eel proxies to determine habitat-based silver eel production). Use of direct methods, though preferable in many respects, will be severely restricted by uneven distribution of silver eel fisheries within and between regions, limited fishery monitoring resources and extreme fluctuations in river flows during migratory runs affecting the efficiency of capture methods.

A variety of indirect methods, mostly dependant on yellow eel proxies and modelling, are available for areas where direct measurements of silver eel escapement are not possible and should be extensively used to estimate regional and national silver eel escapement. Validation of indirect methods should be undertaken on an ongoing basis for a network of river systems where reliable direct estimation of silver eel escapement biomass is possible. Direct assessment of silver eel may, however, not inform on the impacting factors that require management, where yellow eel monitoring and assessment would be more informative.

Estimation of effective spawner biomass requires quantification of the adverse effects of contaminants, parasites, diseases, low fat levels, non-lethal turbine damage, along the lines previously proposed for *Anquillicola crassus*, as well as other mortality rates throughout the river basin. Present knowledge does not fully permit quantitative assessment of the effects of these factors on the overall stock. The European Eel Quality Database (EEQD) has been updated with data on contaminants, parasites and fat levels in eel, allowing the compilation of an overview of the contaminant load in eel over its distribution area. The data are highly variable within river basin districts, according to local anthropogenic pollution, linked with land use. Persistently elevated contamination levels, above human consumption standards, are seen in many European countries. Fat content of the yellow eels (i.e. in Belgium and the Netherlands) has decreased over the last number of years, which raises concern regarding the migratory and reproductory success of silver eels. *A. crassus* is spreading further into new areas and new data indicate the presence of the nematode in Canada for the first time.

At present, it is estimated that around 7.5 to 15% of the glass eel catch is used for stocking, either directly or as on-grown eels. Estimates suggest an insufficient supply of glass eel from the total fishery for stocking to full capacity at the European level. Nevertheless, the Regulation 1100/2007 requires that 35%, rising to 60%, of glass eel catches are made available for stocking to enhance the stock. If these percentages were applied to recent annual catches of glass eel, the potential lifetime effect of this increased level of stocking, in the absence of anthropogenic mortalities, could be in the same order of magnitude as current fisheries or eel culture. However, there is a continuing and urgent requirement for robust evidence of the extent to which stocking and transfers on local, national and international scales can increase silver eel escapement and spawner biomass.

The risks remain of disease and parasite transfer via stocked material, both from stocking glass eel and on-grown eels. For example, eels in aquaculture infected with pathogens (viruses, etc.) should not be used for stocking purposes. At least half the countries surveyed (17) do not have formal stocking protocols. These should include procedures to prevent the introduction and spreading of parasites and diseases, and

eel should be included in the European fish disease prevention policies to help minimize the risks.

Sufficiently long time-series of glass eel recruitment, covering several periods of the natural climatic oscillation over the North Atlantic, reflect the same periodicity. However, the causal link between climate and recruitment strength, is unknown, as well as where and when ocean environmental factors operate on the eel. As long as the causal factors of oceanic influence are unknown, it is not safe to assume that the decline is explained by climate alone, especially while anthropogenic influences are known to be large and better understood. The fact that oceanic climate may contribute to recruitment variation is not grounds for abstaining from all possible measures to increase silver eel escapement to boost spawning-stock biomass. The recent, prolonged strong decline in eel recruitment is out of phase with the dominating climate cycle, the North Atlantic Oscillation.

FAO European Inland Fisheries Advisory Commission; International Council for the Exploration of the Sea.

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