

ACHIEVING FISHERIES AT MSY LEVELS

SUMMARY

The present focus, on implementing the commitment to fish at maximum sustainable yield levels, is on single stock based fishing mortality rates. This approach neglects the fact that different species are caught together and that fish eat other fish. Indeed single species targets may not be simultaneously achievable.

It is suggested that the commitment to deliver stocks fished at maximum sustainable yield rates is most robustly delivered through examination of yields from multi-stock and multi-fishery complexes, translated into regional fishery management plans.

INTRODUCTION

The Community and its Member States have subscribed to an international political commitment at the World Summit on Sustainable Development at Johannesburg (September 2002) to maintain or restore stocks to levels that can produce the maximum sustainable yield (MSY), with the aim of achieving these goals for depleted stocks on an urgent basis, and where possible not later than 2015. Similar commitments have been made by other States within the North Atlantic fisheries region.

In practice, this is now widely interpreted as - maintain stocks at a healthy size and fished at a rate that will, on average, deliver a MSY i.e. Fmsy.

This year, ICES has provided advice with options to achieve Fmsy by 2015. The advice is based upon either equal 20% reductions in current fishing rates to get to Fmsy, or else one further moderated by additional reductions if the stock size is, in effect, below Bpa the precautionary biomass reference level. To apply this model for advice a value for Fmsy has to be selected.

Whilst we fully support the principle that stocks should be managed at secure, MSY levels, we have concerns that some significant issues, themselves raised by ICES, are not being taken into account in the potential move to MSY levels.

We highlight these concerns, and suggest a way forward consistent with Member States' commitments. We also comment on the socio-economic aspects of implementing the ICES model of achieving the MSY objectives.

ISSUES ASSOCIATED WITH IMPLEMENTATION OF THE ICES MODEL OF ACHIEVING MSY BY 2015

The F to be achieved

ICES states:

Maximum sustainable yield is a broad conceptual objective aimed at achieving the highest yield possible over the long term (an infinitely long period of time). It is non-specific with respect to: (a) the biological unit to which it is applied; (b) the models used to provide scientific advice; and (c) the management methods used to achieve MSY. The MSY concept can be applied to an entire ecosystem, an entire fish community, or a single fish stock. The choice of the biological unit to which the MSY concept is applied influences both the sustainable yield that can be achieved and the associated management options. For reasons discussed later, implementation of the MSY concept by ICES will first be applied to individual fish stocks.

In practice, MSY depends on:

- The production function of the unit, which describes the relation between productivity and the size of the unit (e.g., population biomass), which in turn depends on the growth rates, natural mortality rates, and reproductive rates of the members of the production unit;
- Interactions between members of the production unit and interactions with other production units (intra- and inter-specific interactions);
- Environmental conditions (e.g., climate, environmental quality), which affect the production function, and intra- and inter-specific interactions; and
- Fishing practices that determine the size and age composition of the catch (both the landings and the discards).

ICES advice, as stated above, is based upon single-species, or stock, considerations. It ignores that fish are caught together in a fishery. It ignores that fish eat other fish.

There is good reason to believe that these issues can have a significant bearing on the F_{msy} of a stock. One study on the North Sea roundfish¹, found that application of an ecosystem model resulted in estimated F_{msy} rates twice that of conventional F_{max} rates (i.e. the maximum of the yield per recruit curve), and estimated F_{msy} results from ICES MSVPA (multispecies VPA) model were twice the ecosystem rates of F_{msy} . The study reaffirmed that in general F_{msy} values will be higher, for the main whitefish, when biological interactions are included. It also concludes that single species MSYs are unlikely to be achieved through the simultaneous application of single species F_{msy} rates.

ICES is developing models of fisheries interactions, and is a world-leader with its multispecies modelling. Earlier ICES work has explored the sensitivity of North Sea stock sizes, and stock reference levels, to biological interactions². However, such studies have not yet informed the debate on appropriate F_{msy} values.

Even within the estimation of single species, or stock, advice, there is considerable variation over the mean of the estimates of F_{msy} . Two examples are given below.

¹ Mixed-fishery or ecosystem conundrum? Multispecies considerations inform thinking on long-term management of North Sea demersal stocks. Mackinson et. al. Can. J. Fish. Aquat. Sci. 66: 1107–1129 (2009)

² Report of the Study Group on Multispecies Assessments in the North Sea. ICES CM2003/D:09

For North Sea haddock, ICES offers a “provisional” value for F_{msy} of 0.3/y. This is consistent with the Management Plan. But taking into account reasonable but different methods of estimation, ICES found other mean values of 0.25 to 0.43. These have a confidence range of 0.18 to 0.60.

For North Sea cod, ICES offers a provisional value of $F_{msy} = 0.19$. But they give a range of mean values of 0.16 to 0.43, and a coefficient of variation of 23-30%. The current Management Plan strives for an F of 0.4.

We conclude from the above that the current proposals fail to take account of major fishery and biological interaction, and the values themselves are subject to significant uncertainty.

The rate of approach to F_{msy}

It is difficult to argue a case for achieving F_{msy} levels over four years when the target is so unclear for the reasons given above.

The rate of approach is further complicated by the general EC approach, of reductions in F to F_{msy} in five equal steps, being embedded within the policy categories which call for slower or faster cuts depending on the state of the stock. ICES has also suggested greater cuts in F for stocks below B_{pa} .

We think that that the rate that any nominal F_{msy} is achieved should be set on a fishery by fishery basis.

SOCIO-ECONOMIC CONSIDERATIONS

If it was just a matter of supporting the overall recovery of stocks, the above arguments might be real but academic. But in fact the rapid move to sometimes much lower fishing mortality rates implies years of cuts in catches, before the lower fishing rates deliver higher stocks and catch rates.

The economic position of much of the demersal sectors, already impacted by severe restrictions to implement cod recovery plans, is not robust to potential years of further cuts.

It is therefore vital that the socio-economic position of the fishing sectors be taken into account when implementing a policy that in practice is difficult to define with any certainty.

A WAY FORWARD

We believe there is a way forward, anticipated by COM(2010)241, the Commission’s policy for fisheries management in 2011.

The policy paper recognises that many agreed Management Plans (MP) have an estimated value of F_{msy} as an explicit target. Some of these plans have

been agreed, and indeed developed with, the industry. As such they have a wide degree of support. We agree that these MPs should be implemented.

The Commission's policy paper also suggests that new, or revised MPs, have as their target an Fmsy. Again we agree.

However we see the process of developing these MPs possibly differently from that of the Commission. Two key considerations need to be included: regionalisation and a better, wider science.

A key theme of CFP reform is to allow more subsidiarity and responsibility to regions. This will facilitate better governance, more buy-in from stakeholders and local decisions being made locally. We see MPs being developed on a regional basis, taking account of the mixed nature of the fisheries. We see MSY fishing rates being agreed that are appropriate for mixed fisheries and for multispecies assemblages with a complex of fleets.

To achieve this we would need to work regionally with scientists to explore the implications of the mixed and multispecies fisheries for maximum sustainable yields in a wider context than the current single stock advice.

The outcome would be a set of fishing mortality rates for each stock that together are consistent with the behaviours of fish and the fleets, and which deliver some optimum catch from the complex of stocks and fisheries. As important would be a set of targets that had the support of all interested parties. We believe such plans can be implemented before 2015.

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