

Recovery plans for fish stocks threatened with collapse
Information Sheet No 1: Multi-annual process for selection of TAC's
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1. Introduction

Recent scientific advice from the International Council for the Exploration of the Sea (ICES) has indicated that excessive fishing pressure has eroded a number of fish stocks to the point where their capacity to replenish themselves by reproduction is severely threatened. In brief, there is a severe risk that these stocks will collapse.

The stocks concerned are:

- Blue whiting in the North-east Atlantic
- Cod in the eastern Baltic
- Iberian *Nephrops*
- Cod in the Kattegat
- Cod in the North Sea and Skagerrak
- Cod to the west of Scotland
- Cod in the Irish Sea
- Hake – northern stock

For blue whiting, a recovery plan will be elaborated within NEAFC.

For cod in the Baltic a recovery plan has been elaborated in IBSFC. This plan is being implemented by the Community.

For the Iberian *Nephrops* stocks, the Commission recognises that the scientific advice is of a different analytical nature to that for the other stocks indicated above (due to the difficulty to estimate age in this species), particularly with respect to predictions of future catches and associated biomass. However, as scientific advice becomes available, the Commission intends to take a similar approach to that of cod and hake. As a first step the Commission intends to propose a TAC for 2002 which would reflect the need to start taking remedial action.

This document is mainly concerned with the approach to be taken for the last five of the stocks listed above.

2. Definition of objectives for the recovery plans

The Commission will propose to rebuild the quantities of mature fish in each of the stocks threatened with collapse to the precautionary levels of spawning stock biomass currently advocated by ICES. The table below compares these target SSB levels with current SSB estimates

Stock	Target SSB (tonnes)	Current SSB (1999-2000)
Kattegat Cod	10500	6000
North Sea Cod	150000	54000
West Scotland Cod	22000	5000

Irish Sea Cod	10000	4500
Northern Hake	165000	87000

3. Options for the recovery strategy

The Commission has considered possible strategies. There appear to be two basic options.

3.1 A recovery plan based on pre-determined fishing mortality rate.

Under such a system, the fishing mortality rate to be exerted on each stock for the duration of the recovery programme would be agreed in the light of scientific advice. The TAC would be set for each stock in each year accordance with the pre-determined mortality rate. Fishing effort in accordance with the mortality rate(s) would also be defined.

3.2 A recovery plan intended to provide high probability of year-on-year increase in quantities of mature cod and hake

Under such a system, the intention would be to define TAC's for each year of the recovery such that the TAC is associated with a high probability that at the end of each year there will be more mature fish in the sea than at the start of that year. Under such a system, the fishing mortality rate (and the corresponding fishing effort) will vary from year to year.

3.3 The Commission's preferred option.

The Commission prefers the second option. The main point of concern at present is that the quantities of mature fish in the sea are far too low. The intention, therefore, is to establish a process whereby these quantities will have a high probability of increasing from year to year. Under the first option, there is a risk that, on some occasions at least, the quantities of mature fish might decrease from one year to the next.

In either case, it should be noted that TAC's will not be constant or even necessarily similar from year to year.

4. Selection of TACs

The Commission will propose that in each year of the recovery period and for each threatened stock, a TAC will be selected at a value for which the most recent scientific advice indicates that at the end of the year to which the TAC applies, there will be 30% more mature cod and 15% more mature hake in the sea than there was at the start of that year.

This approach implies that the TACs to be proposed for 2002 may be of the order of magnitude indicated below:

Northern Hake	17000 tonnes
North Sea Cod	62000 (North Sea), 8900 (Skagerrak), 2000 (Eastern Channel)

Kattegat Cod	2000
Irish Sea Cod	4000
West Scotland Cod	3700

(N.B. These are estimates of the services of DG Fish, based on currently available information, and may be modified as a result of ICES's definitive scientific advice in October).

In the event that strict application of this approach leads to a TAC for a given year which is more than 50% less than the TAC for the previous year, a higher TAC would be proposed by the Commission, in order to avoid a too dramatic short-term reduction of the TAC. However, the Commission would in no circumstances propose a TAC that would generate a fishing mortality rate greater than the precautionary level (F_{pa}) advocated by ICES. Under this scenario, TACs for 2002 would be higher than those referred to above.

The process described is expected to lead to safe and rapid recovery of the stocks, taking into account uncertainties in scientific estimates. From a strictly biological point of view, and to allow the most rapid rate of recovery, catches of cod and hake should cease. However, the Commission recognises the severe social and economic consequences which would accrue from such an approach, including loss of catch of other species taken when catching cod and/or hake.

If a 30% or 15% increase is expected, the achieved increase might be less but there is high probability that it will not be zero or negative. The 30% or 15% condition provides reasonable security that some gain will always be achieved. The choice of 30% or 15% is based on preliminary investigations carried out by officials of DGFISH. Their investigations will be referred to scientist experts for comment and possible amendment.

5. Expected time-span for recovery

The graphs in the annex to this note indicate the expected effects, and hence the time span for recovery, of the application of the proposed approach, in terms of the evolution of the spawning stock biomass, yields (and therefore TAC's) and fishing mortalities.

(N.B. Here again, these estimations have been carried out by DG Fish services on the basis of the available information, and may be modified as ICES new scientific advice becomes available at the end of October).

No guarantees can be given since it is possible to envisage a sequence of undesirable events such as a series of poor year classes. However, it is hoped that recovery of the mature cod stocks can be achieved within *five years*. Recovery of the mature hake stock can be expected to take a longer period, probably *seven or eight years*.

These periods would allow a recovery to the target levels of biomass while maintaining a certain level of fishing. Different recovery periods are also possible while maintaining the same target biomass. However, shorter periods would require

too dramatic short-term reductions in the fishing activity, and longer periods would result in an excessive delay in the recovery.

6. Disparity of treatment of cod and hake

The disparity between cod and hake in year-on-year increase in biomass (30% or 15%) and in the time span for recovery of the quantities of mature fish arises because the hake stock is subject to less fishing pressure than the cod stocks. In simple terms, this means that cod will “react” to a greater extent and more rapidly than hake when fishing pressure is reduced. Also, hake become mature at a higher age than cod and therefore there is a longer time delay for juveniles to become adults.

7. Liaison with Norway

Cod in the North Sea and Skagerrak are jointly managed by EU and Norway and it will be necessary to agree the multi-annual process with them.

Annex

The expected development of spawning stock biomass, yield and fishing mortality rate for stocks subject to the recovery strategy indicated in this document is shown in the attached figures.

There is a 5% probability that spawning stock biomass, yield or fishing mortality rate will fall to levels below the lowest line on the figures.

There is a 5% probability that spawning stock biomass, yield or fishing mortality rate will exceed levels above the uppermost line in the figures.

There is a 50% probability that spawning stock biomass, yield or fishing mortality rate will achieve levels above or below the central line in the figures.

Target biomass levels are indicated by a horizontal dotted line on each figure showing expected development of spawning stock biomass.











