

# Management Plan for Western Horse Mackerel

## Pelagic RAC

July 2007

This plan was discussed and agreed upon by the Executive Committee of the Pelagic RAC on 13 July 2007 for submission to the European Commission. The plan was developed in cooperation with an *ad hoc* group of scientists. It provides for an exploitation regime that is considered consistent with fishing at  $F_{MSY}$  and is presented as a means by which to manage the western horse mackerel stock.

This plan is divided into general provisions (Section 1) and a specific harvest control rule (Section 2). The normal harvest control rule may be adjusted in periods of elevated productivity (Section 3).

### 1. General provisions

The parties agree on a management plan for the western horse mackerel stock, with the following general provisions:

- The plan provides for conditions for sustainable long term yield for the stock.
- The plan provides for achievement of acceptable year to year stability in the TAC.
- A unified management regime across all areas where the stock is distributed
- That there are not additional catches to those covered by the TAC.
- The industry agrees to partake in studies to demonstrate that there are no additional catches above the level of the TAC.
- Productivity of the stock assumed to reflect the conditions for the period 1982 to 2005. However, the plan was tested under conditions where no strong year-classes of the magnitude of the 1982 year-class occur.
- That the TAC is set on a triennial basis based on egg abundance from the most recent three surveys
- Target fisheries will proceed with minimum ecological impact. The industry undertakes to partake in studies to quantify the levels of non-target by-catch.

### 2. Normal decision rule

For 2008 and subsequent years the TAC will be set according to the following rules:

1. *The TAC will be set for 3 years following the year of the most recent survey.*
2. *The TAC will be fixed at the set level for a period of 3 years.*
3. *In the event of the TAC being overshoot in any year in the fixed period, the overshoot (as estimated by ICES) will be subtracted from the following years TAC. This needs to be tested by simulation.*

4. *In the event of a survey result not being available, ICES will be asked to advise on the state of the stock and on exploitation boundaries consistent with the Precautionary Approach.*
5. *The TAC will be set according to the following rule:*

$$TAC_{y-y+2} = 1.07 \left[ \frac{TAC_{ref}}{2} + \frac{TAC_{y-3}sl}{2} \right]$$

*Where  $TAC_{ref}=150,000$  t and  $sl$  is a function of the slope of the most recent egg abundance estimates from surveys (see annex)*

#### Arrangements for reviewing the decision rules:

The plan will be reviewed and re-evaluated in 2009 and on three yearly intervals thereafter to ensure that:

1. SSB has been maintained above  $SSB_{1982}$ .
2. That the uncertainties and bias in the fishery and biological system remain within the bounds of those tested.  
and that the assumptions made in the simulation testing phase are still valid.

If either of the above has been violated the plan will be modified to adapt the decision rule to make it consistent with the precautionary approach.

### **3. Special conditions to apply in times of high stock productivity**

If a recruitment event is the same or greater than that which occurred in 1982, as determined by ICES, the following will apply:

- The detection of the recruitment event will be established no sooner than 4 years after its occurrence.
- The level of the recruitment will be established based on ICES interpretation of the most valid assessment.
- After verification of such an event, by ICES, the decision rule will be adapted for as long as that year class contributes to the stock and the fishery .ICES is asked to develop a metric to determine the duration this period of elevated productivity. Such a metric would identify when the terms of the normal decision rule above will be reverted to.

## Annex

### Computations to estimate the f(slope) parameter ( $sl$ )

- 1) Divide the last three egg estimates from the triennial survey by  $10^{15}$ ;
- 2) Compute the slope ( $b$ ) for years 1, 2 and 3;
- 3) If
  - $b \leq -1.5 \Rightarrow sl = 0$
  - $-1.5 < b < 0 \Rightarrow sl = 1 - (1/-1.5 * b)$
  - $0 \leq b \leq 0.5 \Rightarrow sl = 1 + (0.4/0.5 * b)$
  - $b > 0.5 \Rightarrow sl = 1.4$

