



## **Harvest Control Rule for Plaice in Skagerrak**

In 2011 the NSRAC proposed a draft Harvest Control Rule for plaice in the Skagerrak. The draft HCR was based upon the knowledge of the stock structure from a collaborative research project between the Danish Fishermen and DTU Aqua (The Danish National Institute of Aquatic Resources). Since then, ICES has held a dedicated workshop (WKPESTO) for the plaice stocks from Skagerrak to the Baltic which led to a revised stock structure in the ICES advice.

### **RESULTS OF ICES WORKSHOP AND EVALUTION OF DRAFT HCR**

This revised proposal for a HCR for Skagerrak is based upon the results of WKPESTO and the subsequent ICES advice in May 2012. The main conclusions of WKPESTO (ICES CM 2012/ACOM:32) and the ICES advice 2012 (section 6.4.6) concerning management of plaice in the Skagerrak were:

- Plaice abundance in the Skagerrak – especially in the Western part where 90 % of catches are taken – is so linked with developments in the North Sea that the best option is to make a combined North Sea and Skagerrak stock assessment. In other words, plaice in the North Sea and Skagerrak should be considered one stock – with one or more sub-components especially in the Eastern part of Skagerrak.
- Area based survey indices from the Skagerrak show developments in the Western part similar to the North Sea (i.e. growing CPUE); but low, and falling, CPUE in the Eastern part (where landings are already low, and where the degree of local Skagerrak stock components are expected to be highest).

- The approach of the NSRAC draft HCR is generally sensible and in line with the state of the art of the biological knowledge, with some adjustments:
  - o The local index of abundance for the Skagerrak should not be commercial LPUE, but the new area-based survey indices.
  - o Because of the low observed abundance in the Eastern part, measures should be taken to protect the local components in this area.
  - o There should be a clear definition of when the indices are 'rising' and 'falling' (level of change, for how many years, compared to what etc.).
  - o The draft HCR is not sufficiently precautionary when North Sea SSB is rising and Skagerrak abundance falling.

## **BACKGROUND TO PROPOSED CHANGES**

In the draft HCR, the Skagerrak TAC was initially set as a parallel to developments in the North Sea SSB (SKA TAC increases/decreases with same rate as NS SSB). As ICES now proposes a combined North Sea & Skagerrak assessment, it is no longer necessary to 'copy' North Sea developments into a Skagerrak HCR. Instead this revised HCR is based directly upon a combined assessment, leading to a combined TAC subsequently split into two TACs, one for the North Sea (according to the North Sea management plan), and an *initial* TAC for Skagerrak.

The initial TAC for Skagerrak is based upon the contribution of the plaice found in the Skagerrak to the combined SSB. The average contribution to SSB over the last 10 years (2002-2011) has been 13% (ICES advice 2012, figure 6.4.6.1).

However, as the North Sea LTMP does not yet take account of the new stock delineation, the initial Skagerrak TAC will have to be lower than 13 % in those instances where the North Sea LTMP leads to a North Sea TAC that is higher than 87 % of the combined TAC.

This initial Skagerrak TAC is then modified according to local developments as identified in the area based survey indices. The modifications are different for the two areas (East and West). This is because the underlying assumption of the HCR – that most of the Skagerrak plaice catches can be considered as coming from a North Sea & Skagerrak combined stock – can be correct even if developments in Eastern Skagerrak differ from the North Sea. But if abundance in the Western part develops very differently from North Sea abundance, then the assumption is seriously questioned and the management approach should be adjusted accordingly.

The delineation of Eastern and Western Skagerrak is taken from ICES advice 2012 (6.4.6. Figure 6.4.6.2)

The reference points suggested for Eastern Skagerrak are based upon the IBTS survey time series (1974 – present), as well as a reconstructed time series of abundance reaching back to 1901 (Cardinale et al. 2011). As the abundance in the entire period of the survey time series is considered to be low compared to historical levels, the lower limit is set at the average CPUE of the survey time series, and the upper target at the highest point in the time series.

It has not been possible to collate exact data on recent years' catches of plaice by all countries in the Eastern area. The levels proposed (500 t and 1000 t), are therefore guesstimates. There are currently no directed fisheries of plaice in the Eastern Skagerrak, so the lower level (500 t) is proposed to minimize the mortality of plaice in the Eastern area, while allowing for landings (and thus avoiding discards) of by-catches of plaice in other fisheries. ICES is encouraged to calculate recent years landings by area, and if these are much lower or higher than the proposed 500 t, the figure should be adjusted accordingly.

The upper level (1000 t) is proposed to avoid a rapid expansion of the plaice fishery in the event of an increasing stock – while allowing for the inevitably higher by-catches that follow.

The definition of trend (rising/falling) used here is developed from the ICES Data Limited Stocks framework (ICES CM 2012/ACOM:68, Category 3).

## **THE PROPOSED HARVEST CONTROL RULE**

### **INITIAL SKAGERRAK TAC**

1. ICES performs a combined assessment for the North Sea and Skagerrak.
2. Total allowable catches (landings + discards) for the combined area is calculated, based upon the applicable fishing mortality in the North Sea LTMP.
3. Until a revision of the North Sea LTMP takes the new stock delineation into account, the Skagerrak TAC is the *lower* number from the two methods in 4. and 5. below.
4. Out of the combined TAC, the Skagerrak TAC is 13 %. Skagerrak total allowable landings will be TAC minus estimated discards.
5. Out of the combined TAC, the NS TAC is deducted. A separate North Sea only assessment is performed to inform this North Sea TAC. The Skagerrak TAC is set as

the remaining difference between the combined TAC and the 'pure' North Sea TAC. Skagerrak total allowable landings will be TAC minus estimated discards.

#### PRECAUTIONARY STEP-WISE CHANGE

6. If in the first year of application of the HCR, the difference between the TAC as set before the application and as set according to this HCR is more than 25 %, then the change in TAC shall be implemented step-wise over a period corresponding to maximum 25 % change per year.

#### EASTERN SKAGERRAK

7. ICES updates the Skagerrak area based survey index.
8. An abundance limit is proposed at 6,0 in the survey index.
9. An abundance target is proposed at 10,0 in the survey index.
10. If the average of the last three years' survey index for the Eastern part of the Skagerrak is below the limit, then a maximum of 500 tons out of the total Skagerrak TAC may be taken in this area.
11. If the average of the last three years' survey index for the Eastern part of Skagerrak is above the limit, but below the target, then a maximum of 1000 tons out of the total Skagerrak TAC may be taken in this area.
12. If the average of the last three years' survey index for the Eastern part of Skagerrak is above the target, no area-specific limit shall be set.

#### WESTERN SKAGERRAK

13. If the difference between the trend (see 14.) of the survey index for the Western part of Skagerrak and the trend of the North Sea SSB is more than 1.5 then the underlying stock assumption in the HCR is questioned and the HCR shall be reevaluated and adjusted accordingly.
14. Until the HCR has been adjusted:
  - a. If the trend of the Western Skagerrak index is lower than the trend of the North Sea SSB trend (e.g. Skagerrak falling, North Sea rising), then the initial Skagerrak TAC shall be lowered by 25 %.
  - b. If the trend of the Western Skagerrak index is higher than the trend of the North Sea SSB trend (e.g. Skagerrak rising, North Sea falling), then the initial

Skagerrak TAC shall be raised by 25 %, unless this leads to an unsustainable exploitation of the combined stock.

15. The trend of the survey or the North Sea SSB is defined as the average of the last two years CPUE/SSB compared to the average of the preceding three years.

As ICES notes, survey coverage in the Western part of Skagerrak is poor. The NSRAC urges the Member States, National Institutes and the Fishing industry to collaborate in order to extend survey coverage in this area, as soon as possible.

#### INTERRIM HCR

16. This interim HCR is based upon qualitative knowledge and expert opinion regarding stock delineation and mixture in the Skagerrak and adjacent areas. As new knowledge arises from current and future projects and data collection, it is expected that it will be possible to genetically identify and quantitatively estimate the stock components and degree of mixture. When such quantitative knowledge becomes available and operational, the HCR shall be adjusted accordingly.

Map of the sub-areas (taken from ICES advice 2012, figure 6.4.6.2)

