

## **Proposal for HCR for plaice in Skagerrak**

Despite the fact that plaice in Skagerrak and Kattegat are managed as two stocks with each their quota, ICES only gives advice for one entity. In 2011 – and a number of years before that – ICES have only been able to offer advice based on precautionary considerations. Based on conflicting stock information the advice is to reduce catches.

The fishermen find this hard to accept, as they experience increasing catch rates in Skagerrak, albeit catch rates in Kattegat are decreasing.

Research undertaken by DTU Aqua in a joint project with the Danish Fishermen has shown that the Skagerrak-Kattegat plaice stock assessment cannot be fixed with ‘standard’ ICES model tweaking and data improvement. The natural growth pattern in the Skagerrak is too variable to make age-based assessment possible, and the issue of stock boundaries (especially North Sea – Skagerrak and Skagerrak – Kattegat) is unresolved. The project also demonstrated that misreporting of catches is negligible.

It is the ambition of the Skagerrak/Kattegat Working Group of the North Sea RAC, in cooperation with scientific institutes, to prepare a management plan for plaice in Skagerrak and Kattegat. Work is in progress, but as an interim measure, the WG proposes to set a harvest control rule for plaice in Skagerrak based on the following assumptions:

1. The plaice in the Skagerrak *may* be:
  - a. Of the same stock as the North Sea
  - b. A mixture (of unknown proportions) of North Sea and a ‘local’ stock.
2. The plaice stocks in the Skagerrak and the Kattegat *may* be partly connected (degree of mixture unknown).
3. Because the majority of plaice taken in the Skagerrak are from the area adjacent to the North Sea, and because the North Sea stock is much larger than the Skagerrak stock (if such a stock exists), assessment and management of the Skagerrak is particularly vulnerable to North Sea stock developments.
4. SKA fishing has negligible impact upon NS stock, when NS SSB is above B trigger.
5. SKA fishing *may* have an impact upon NS stock, when NS SSB is below B trigger.
6. NS stock size has, especially when SSB is above B trigger, a significant influence upon SKA abundance.
7. SKA and KAT stock sizes may have mutual influence, but this is within what can be absorbed through precautionary management.
8. The North Sea stock assessment is fairly reliable, and NS SSB is thus a good measure of North Sea stock size.

9. As the natural growth patterns of plaice in the Skagerrak are extremely variable, any age-based assessment of the stock would be too unreliable.
10. As survey coverage in the Skagerrak is very sparse and only includes the eastern part (whereas the majority of landings come from the western part), the existing surveys cannot provide a reliable index of stock size or development.
11. The best index of Skagerrak stock size would therefore be a version of the two existing commercial tuning indexes (Danish gill netters and Danish seiners), truncated to only include catches and effort from the Skagerrak.
12. As commercial tuning indexes are sensitive to major regulatory or economic changes (for example changes in minimum mesh size), survey coverage should be extended to the western part with enough coverage to provide a robust index of abundance.

**Therefore:**

Until further knowledge is collected, the management of plaice in Skagerrak could be partially linked to the North Sea, through setting a SKA quota-level that is based on a balance between developments in NS SSB and SKA tuning fleet LPUE levels.

When the North Sea stock is above B trigger:

Purpose: to ensure high medium-term yield (“approximate MSY”) in the Skagerrak and avoid local depletion.

1. In cases where simultaneous increases or decreases in NS SSB and SKA LPUE are observed, the TAC for SKA shall increase or decrease with the same rate of change as is observed for the NS SSB.
2. When the developments in the two indices are in opposite directions, the TAC for SKA shall be set as a roll over.

When NS SSB is below B trigger:

Purpose: precaution to avoid potential risk to reproductive capacity of overall stock complex (NS and SKA).

1. When NS SSB is increasing, the TAC for SKA shall be set as a roll over
2. When NS SSB is decreasing, but SKA LPUE is increasing, the TAC shall decrease with the same rate as NS SSB
3. When NS SSB and SKA LPUE is decreasing, the TAC shall decrease with the rate of NS SSB

As table:

NS SSB		SKA LPUE	
		RISING	FALLING
Above B trigger	RISING	SKA TAC increases with same rate as NS SSB	SKA TAC remains at same level as previous year
	FALLING	SKA TAC remains at same level as previous year	SKA TAC decreases with same rate as NS SSB
Below B trigger	RISING	SKA TAC remains at same level as previous year	SKA TAC remains at same level as previous year
	FALLING	SKA TAC decreases with same rate as NS SSB	SKA TAC decreases with the rate of the NS SSB

**With the observed increase in catch rates in the commercial fishery in Skagerrak and the positive situation in the North Sea, this would imply a 15 % increase in TAC for plaice in Skagerrak to 9143 tonnes in 2012.**