**Analysis of current SEAFO stocks management strategies and their application in exceptional circumstances**

*European Union*

**SEAFO Stocks Management Strategies**

1. ***Toothfish and Deep-sea red crab stocks***

The SEAFO Commission (SEAFO CC) adopted Harvest Control Rule (HCR) has a straightforward application considering the trend of a biomass index (e.g. the CPUE) over time. Based on the slope value, the catch limit (TAC) to future years is calculated based on the current year’s TAC as follows:



where slope = measure of the trend in CPUE for the recent 5 years.

* λ*u* : TAC control coefficient if slope > 0 (Stock appears to be increasing) : λ*u*=1
	+ λ*d* : TAC control coefficient if slope < 0 (Stock seems to be decreasing) : λ*d*=2

The TAC generated by the HCR is constrained to ± 5% of the TAC in the preceding year.

1. ***Alfonsino stocks***

Due to the limited data available to provide scientific advice, an Empirical Harvest Control Rule (HCR) to regulate the fishery was adopted by SEAFO CC. If more and better data will be made available a revision of the HCR should be envisaged.

The adopted HCR corresponds to the average catch of the last three years, but to cope with the stock status uncertainty an additional 20% cap is applied. This strategy is similar to that adopted in ICES Category 5 stocks, i.e. data poor stocks for which only landings data are available.

Following that the advice TAC corresponds to the mean of catches for the last three years as $\overbar{C\_{y}}$

$$\overbar{C\_{y}}=\frac{\sum\_{i=y-2}^{y}C\_{i} }{3}$$

and the catch advise for the following year, i.e. 𝐶𝑌+1, is given as:

 𝐶𝑌+1 = 0.8×$\overbar{C\_{y}}$

**Current situation**

***Deep-sea red crabs***

In 2016, no catches were recorded outside SEAFO Division B1, so the 2017 recommended TAC was only applied to Division B1.

TAC2017 = TAC2016\* (1 + (2 \* slope))

TAC2017 = 190 t \* (1 + (2 \* -0.1213)) = 144 t (This would imply a reduction of *24%*)

Constrained by rule

TAC2017 = 180 t (*-5% constrain of 2016 TAC*)

Important to note that SEAFO Scientific Committee (SEAFO SC) emphasized that, despite that there was no fishery in 2016, the adopted HCR was applied under the assumption that the CPUE trend derived in 2015 has been maintained. However, the validity of that assumption is uncertain.

***Note: When the slope is persistently negative along the years, a more precautionary constraint should be studied (e.g. 15%).***

***What have to be the approach in the absence of data from recent years?***

***Toothfish***

For the Toothfish stock, the adopted HCR requires, as basic input, a 5-year time-series of recent CPUE data. At its 2016 meeting, the SEAFO SC explored the results derived from CPUE standardizations using generalized linear models (GLM). The analysis indicated that the variance explained by the GLM model was too low to get reliable and meaningful estimates. In face of these results the SC recommended further efforts on data analysis.

The SC then resorted to deriving CPUE series for separate fishing areas for which the more wide continuous time-series of catch and effort data are available in the SEAFO database, i.e. the Meteor and Discovery seamounts. Constraining to the 2011 agreed footprint, only Japanese data were available, i.e. from the Contracting Party taking the major bulk of the catch in all years. So, to guarantee data consistency, the advice on TAC only relies on the Japanese data time series.

It is uncertain whether the two nominal CPUE series, i.e. the Meteor and Discovery CPUE series, reflect biomass trend. In the absence of other alternatives, the CPUE series from Meteor and Discovery were considered valid for the derivation of TACs using the recommended and accepted HCR and the weighted average of the CPUE slopes on Meteor and Discovery.

TAC2017 = TAC2016 \* (1 + (1 \* slope))

TAC2017 = 264 t \* (1 + (1 \* 0.007)) = 266 t (*0.008% increase*)

***Note: How to proceed in this situation of uncertainty and also in case of a hypothetical absence of data from recent years?***

***Alfonsino***

In the last three years (including 2016) there were no catches of Alfonsino and due to that the SEAFO SC was unable to apply the adopted HCR.

To overcome this situation, the SEAFO SC considered that the 2013 TAC advice was precautionary and as since 2013 no fishing took place, the Alfonsino stock was likely to have developed. Based on that assumption the SEAFO SC recommended a TAC of 200 t (*status quo*) for the SEAFO CA, of which a maximum of 132 tonnes could be taken in Division B1.

***Note: How to proceed in this situation of lack of information?***

**Exceptional Circumstances Protocol**

1. ***Background***

In 2014, the SEAFO Commission (SEAFO CC ) adopted a new management strategy for Toothfish, Deep-sea Crabs and Alfonsino stocks, based on Harvest Control Rules (HCR). The HCRs will be applied to automatically adjust the TAC based on the recent trend in the CPUE or catches.

Exceptional circumstancesprovisions are intended to respond to an event or observation which is outside of an expected range. In such cases, Commission may have reasons to over-ride the TAC provided by the HCR and/or also require the HCR to be reviewed/revised. To this effect, the SEAFO SC will annually monitor the situation and provide advice to Commission on whether or not ‘exceptional circumstances’ may be occurring.

1. ***Exceptional Circumstances***

Exceptional circumstances may include catches in excess of the range tested or observed CPUE outside the expected range. These should therefore be considered at a primary level. Other indicators that should be considered at a secondary level of importance:

* **Data Gaps**
	+ Incomplete/Missing annual catches or standardized CPUE data; and
	+ Lack of fishing activity.

Ongoing SEAFO SC analysis related to these stocks may also identify other situations which warrant consideration as exceptional circumstances.

Advice provided by the SEAFO SC that suggests the occurrence of exceptional circumstances, should be based on compelling evidence and should include sufficient detail to allow Commission to take an informed decision on implementation of the HCR and possible next steps.

1. ***Implementation***

When the SEAFO SC advice indicates that exceptional circumstances are like to be occurring, the SEAFO Commission will consider a range of responses/possible courses of action taking into account the degree and type of circumstance noted. The responses/courses of action that will be considered, in this sequence, are:

1. Review the information, but maintain the HCR as the management tool; additional research/monitoring may be recommended to determine if the signal detected warrants moving to step 2;
2. Advance the review period, and potentially revise the HCR, but implement the HCR outputs;
3. Set a catch limit that departs from the HCR, and revise the HCR.