

Everything you wanted to know about the 2010 Operational Management Procedure (OMP) for the South African *Merluccius paradoxus* and *M. capensis* Resources

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Introduction

The current hake OMP can be divided into five major components. These are;

- 1) An **empirical description** of the algorithm used to **provide TAC**(Total Allowable Catch) recommendations for the two South African hake species caught in the demersal industry, namely *Merluccius paradoxus* and *Merluccius capensis*.
- 2) **Computational procedures** for the CPUE (Catch per Unit Effort), catch data and survey **abundance estimates** for comparison to a predetermined target level.
- 3) **A description of the catch database**, the problems commonly associated with the data basis and the prescribed solutions for the problems.
- 4) The **procedure** that must be followed regarding any **deviations from the current OMP** output.
- 5) **Projected future values** of the CPUE and survey abundance indices under the current OMP.

While the important aspects of each component are dealt with below, all the mathematical details and indices used in the empirical description of the resource were omitted from this summary due to their technical nature. For details on the empirical component of this OMP, please be advised to consult the full OMP as provided.

1) Empirical description of the 2010 OMP

The TAC determined by the OMP will include and combine the catches for both hake species even though they get dealt with separately in the model. Only the last six years of CPUE data will be used to determine the TAC. The OMP further allows for a maximum allowable annual increase in the TAC of 10%, while the maximum allowable decrease can range between 5 to 25 % from one year to the next. This decrease is determined through a mathematical calculation considering the health of the resource based on catch and survey data. This section further describes the procedure to be followed in the event of missing data, crucial to assess the health of the resource. Non-availability of **CPUE data** is not anticipated, as it is obtained from the industry. In the event of missing **survey data** (obtained from scientific survey trawls), two important outcomes can result.

- If no more than two of the four annual survey estimates are missed, the status quo will be maintained, while the missing data will be omitted from further estimates.
- If more than two such estimates are missing in the same year, or if the same survey is missed in two consecutive years, status quo will be maintained, **but** an OMP review will commence immediately.

2) Computational procedures for abundance estimates

This section deals with the procedure required to standardize CPUE data. This method considers a host of biological and environmental parameters that can affect the CPUE. Amongst these are the

two hake species, geographical profiles, vessel and gear types, trawl depth, by-catch of other non targeted species etc. The CPUE data for these analyses is obtained from the DAFF/MCM database.

3) A description of the catch data basis

The first part to this section describes the methods to be followed by industry for the collection of CPUE data. This is very important to the general operations of the industry and should therefore be studied and implemented by industry (for further detail see pg 12 to 14 of the 2010 hake OMP). It is however very unlikely that this is not currently adhered to, as it generally incorporates (although not exclusively) the collection of data from production estimates.

The second part of this section deals with the sampling strategy, data collections and the calculation of abundance indices during and after demersal research surveys. A great number of details are discussed and dealt with in this part of the OMP, to ensure an unbiased and accurate estimation of resource health.

4) Procedures for deviation from the OMP

The procedures for deviations from the OMP are also described as the **Metarule process**. Metarules can be thought of as “rules” that pre-specify what should happen in the unlikely, exceptional circumstances when application of the TAC generated by the OMP is considered to be highly risky or highly inappropriate. Metarules are not a mechanism for making small adjustments to the TAC (<3%). It is difficult to provide firm definitions of exceptional circumstances. Instead, a process for determining whether exceptional circumstances exist is described. The need for invoking a metarule should be evaluated by the MCM Demersal Working Group, but only provided that appropriate supporting information is presented for review to this working group. It is important to note that the working group includes representation of all the stakeholders. While the broad circumstances that may invoke the metarule process can be identified, it is not always possible to pre-specify the data that may trigger a metarule.

This section elaborates extensively on the determination of exceptional circumstances, and the appropriate process to follow in such a case. It further only considers exceptional circumstances when there is some indication that the hake resource is in serious trouble.

5) Projected future values

The section consist of various tables and graphs that give the future model predicted CPUE, recruitment etc. for the hake industry.

BASIC DESCRIPTION FOR THE CALCULATION OF THE ANNUAL TAC

The TAC for any particular year is calculated as a sum of the allowable catch for each of the two species joined (*M. paradoxus* & *M. capensis*). A species specific allowable catch is calculated using, most importantly, trends observed in the CPUE data and research surveys of the immediate past (i.e. the past six year). This combined with a host of various constants and tuning parameters are then used to calculate TAC. To measure the recent trends in catches and thus the “health” of the hake resource, CPUE data from industry and scientific survey data (west coast summer survey & south coast autumn survey) from DAFF are referenced for different geographic regions (South and West

Coast). The trends then get combined in a specific ratio (weighted average), giving some data more importance or significance to the recent trends observed and ultimately the calculated TAC.

The importance of the various kinds of data is given in the table below. Bigger values show a bigger importance in calculating the TAC for a specific year.

	<i>M. paradoxus</i>	<i>M. capensis</i>
West Coast CPUE data	1	1
South Coast CPUE data	0.75	0.75
West Coast survey data	0.5	0.5
South Coast survey data	0.25	1

To reiterate, the TAC, like a survey, is an absolute value whereas the CPUEs are ratios. The CPUE values must therefore be applied to masses of the species if they are to be of use in predicting the TAC. These masses are not derived directly from the CPUE. Instead the last known year's catch is split into *paradoxus* and *capensis* by way of an established algorithm which takes regional and depth considerations into account. (catch is effectively lagged by a year) This product constitutes the physical basis of the upcoming TAC prediction. The data inputs are translated into trends by way of skilful and impressive mathematical methods and are applied to the products of the species splitting exercise.

At this stage in the life of the fishery the TAC is constituted roughly as follows

Paradoxus 75% contribution
Capensis 25% contribution

It can thus be seen that the CPUE is much the more important TAC indicator than the surveys but the continuity of the survey series is nonetheless necessary (with small breaks permissible).