South African Hake – September 2013 update

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One of the major challenges facing fisheries management systems is the need to develop and refine techniques for effectively addressing uncertainties in the decision-making process. The Operational Management Procedure (OMP) has become a crucial fisheries management tool for considering the consequences of uncertainties inherent in environmental and biological systems. Traditional fisheries management approaches often do not provide a solution to specific management problems for fisheries on their own. Therefore resource managers also have to set goals or management procedures, and only then can mathematical and computer models provide assistance with the decision making process. OMPs are also primarily designed to streamline the fishery assessment process providing consistency in management approach. When OMPs are accepted, interested and affected parties (fisheries managers, fishing industry etc.) agree on the baseline information used in the assessment of the resource under consideration. The baseline data are then updated annually and the model outputs (e.g. Total Allowable Catch) are routinely estimated for an agreed number of years.

The hake OMP – An innovative approach to fisheries management in South Africa.

The South African hake trawl fishery, targeting deep-water hake *Merluccius paradoxus* and shallow-water hake *M. capensis*, is among the first in the world to implement an OMP as a management procedure. The hake OMP is a "set of rules" that specifies exactly how the Total Allowable Catch (TAC) is calculated from stock specific data, such as catch-per-unit-effort (CPUE) indices from commercial logbooks and abundance indices from demersal research surveys. The current data shows that there has been a steady increase in the CPUE for both hake species on the west and east coasts since 2006 (Figure 1).

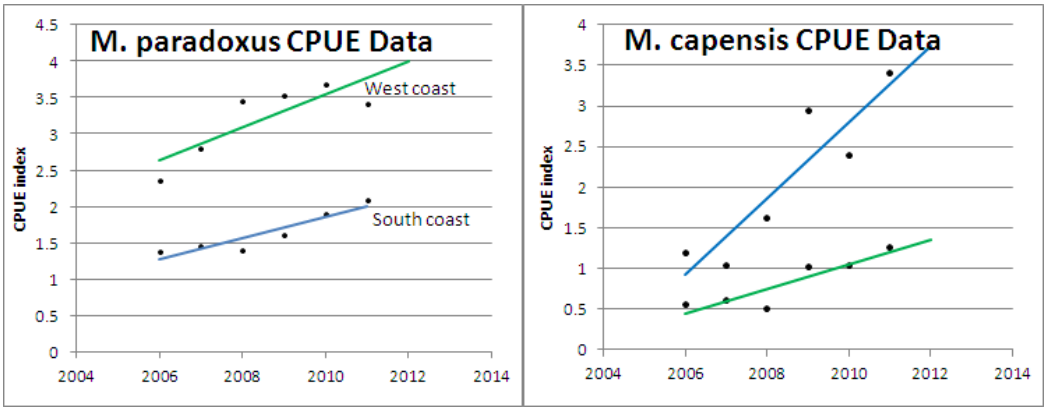

Figure 1. GLM standardised CPUE series used as input in the 2013 TAC computations. Note the values in parentheses are the actual estimates obtained from the surveys (DAFF unpublished data).

Historically, because of the substantial overlap in distribution and the difficulty of distinguishing between the two species of hake, catch data per species were not available from commercial logbooks and they were first assessed and managed as a single resource. More recently, the two

species have been assessed separately (Figure 2) using a species-split algorithm (Gaylard and Bergh 2009) that has been derived from the data collected by on-board scientific observers and historical research surveys.

Inherent in the OMP approach is the revision schedule every four years, to account for new data and to accommodate any changes in the dynamics of the stocks. To ensure that stock parameters do not deviate significantly from what is expected (in the OMP), the underlying stock assessments model is updated annually and the TAC revised. A revised OMP for hake was developed in 2010 and has since been used to provide annual TAC recommendations.

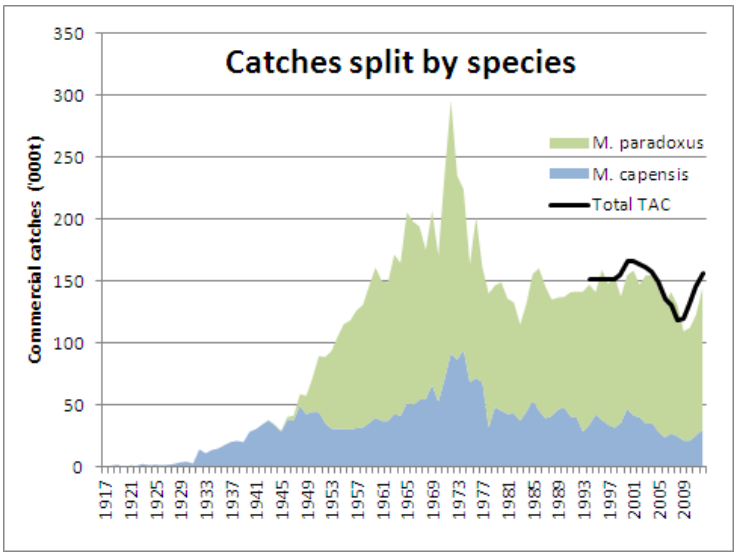

Figure 2. Commercial hake catches split by species for the OMP. Black line indicates the total TAC for both species.

The most recent stock assessment results indicated that the deep-water hake *M. paradoxus* is approaching the Maximum Sustainable Yield (MSY) more rapidly than was projected for the previous two years and it has been anticipated that this target level would be attained by about 2014 (Figure 3). These observations indicate that the *precautionary management approaches* characteristic of the OMP have yielded positive results with both stocks improving. This is further evident from the increasing catch rates realised by the fishing industry in recent years. The current TAC for 2013 is 156 075 tons, a 7.88% increase on the 2012 TAC of 144 671 tons.

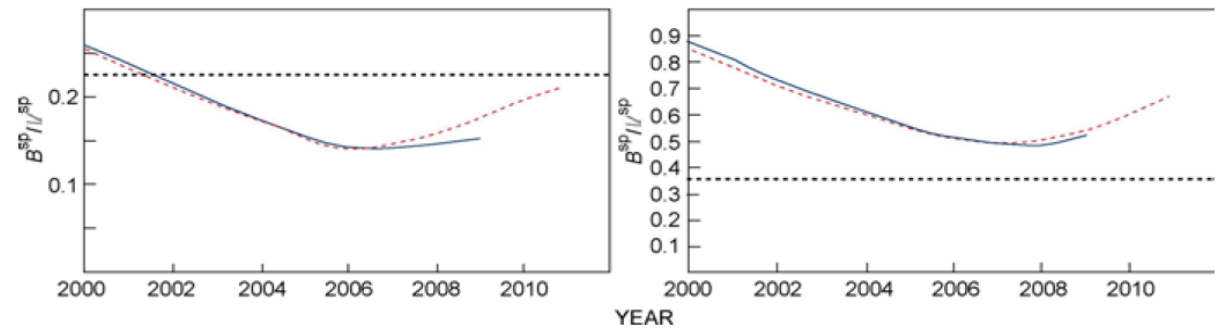

Figure 3. Estimated spawning biomass trajectories for *M. paradoxus* (left) and *M. capensis* (Right) for the years 2000 - 2012. MSY level (BMSY) estimates are illustrated by a black dashed line. (Rademeyer 2011).

Stock specific monitoring data – An integral component of fisheries management

Survey abundance data combined with the CPUE data are essential inputs into the annual stock assessment of both hake species. For the past 30 years South Africa has been conducting research surveys on the west and south coasts using the research vessel, *FRS Africana*. Recently however this vessel was withdrawn from service and thus the industry provided two vessels, the *FV Andromeda*

and the *FV Compass Challenger* to undertake these surveys to maintain a consistent time series of data for the South African hake and small pelagic fisheries.

Data collected by the industry-owned on-board scientific observer program (Figure 4), has also proven to be a valuable means for collecting biological, oceanographic and vessel information. The program has become an essential and integral component in the management of the hake resource and provides additional information that can augment the independent data collection from research surveys and the commercial CPUE data. Most importantly these data are beginning to show inter-annual trends that are not reflected in research-directed surveys that are only done at fixed periods of the year. Further, observer sampling provides real-time scientific data on commercial vessels, providing more direct information on the activities of the commercial trawl industry that is not obtained from either research surveys or commercial catch landings.

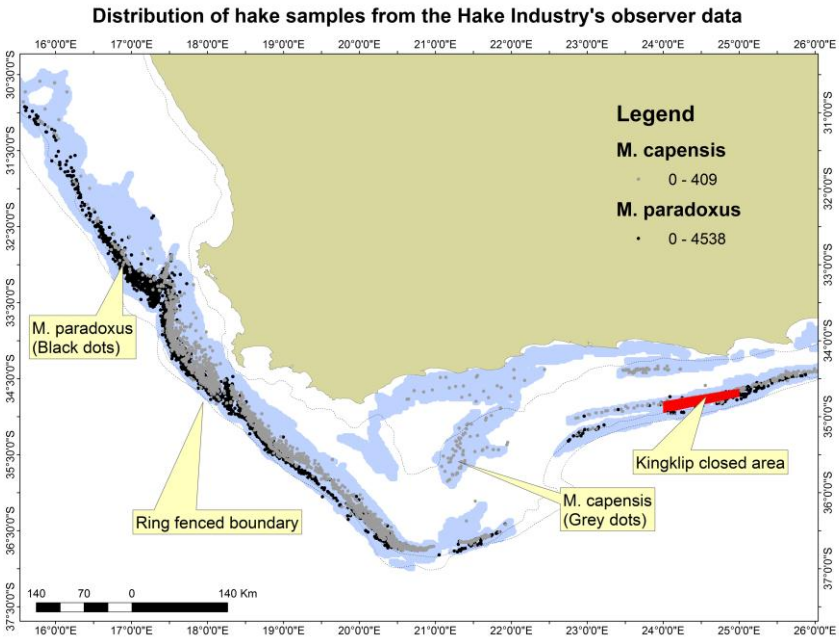

Figure 4. Spatial distribution of hake catches (*M. capensis* and *M. paradoxus*) from the industry's observer database. The ring fenced boundary around the trawl grounds is also shown (Wilkinson *et al* 2009). Red square indicates the seasonally closed protected area.

The MSC certification – A sustainable approach to fisheries management in South Africa.

The South African hake trawl industry boasts the only fishery in Africa to be certified as a sustainable fishery under the Marine Stewardship Council (MSC). This means that the hake fishery has been recognised and rewarded for meeting the global standards for sustainable fisheries practices. Basically, the MSCs standards are divided into three principles covering the health of the target stock, the impact of the fishery on the environment and the effective management of the fishery. Based on these and the performance indicators for each of these principles, the fishery is assessed (scored) to determine its sustainability.

Apart from being MSC certified, hake trawl fishery has also implemented several of its own management measures to maintain the long-term sustainability of the hake resources. These include the implementation of an on-board scientific observer program and the introduction of Precautionary Catch Limits (PCL) and seasonally closed areas (Figure 4) for bycatch species. Measures to reduce damage on benthic habitats have also been introduced such as 'ring-fencing' of existing trawling grounds (Figure 4) to reduce the amount of habitat affected.