# The South African hake fishery - lessons learnt for practically inseparable species

Description of the South African hake fishery

2 units of certification: 2 different species caught using the same gear, the deep-water cape hake, and the shallow-water cape hake.

The two hake species have an overlapping distribution, and although the two species are readily distinguished by trained operators, it is not commercially feasible to separate them when they are caught together due to the practical operation of the fishery.

The shallow-water hake (M. capensis) is found predominantly on the South African south coast from 30m to about 400m and the deep-water hake (M. paradoxus) from about 250m to about 800m. Different sectors of the fleet do target the different species, spatially and temporally. The deep-water hake stock requires re-building to MSY.

Description of the stock assessment and modelling

Data is gathered on the proportions of the two hake species during regular research vessel surveys, this is available on a spatial scale and has allowed separate assessments to be developed for the two species. The observer programme also gathers data on the ratio of species in commercial catches, and informs the implementation of the management approach.

The assessment model used is an Age-Structured Production Model (ASPM). Management advice and the associated TAC’s for South African hake have been developed through Operational Management Plans, which are designed to develop robust management based upon projections of management alternatives under the range of uncertainties in the assessment. Various management objectives, risks and constraints are agreed upon, tested in the simulations, and then form the basis of management actions.

Description of the management

The hake fishery is controlled largely by means of company-allocated quotas within a Total Allowable Catch (TAC), limits on the number of vessels, and closed areas. The TAC is joint for both species.

Vessel operators are now allocated trawling days on the basis of TAC allocation and vessel configuration (size and power). This input control mechanism (sea days) is combined with output control (TAC) such that there is an adjustment of vessel power annually or whenever a permit is renewed. In this way effort-creep is accommodated and continually monitored without additional potential impacts on the resources exploited.

Conditions

In the re-assessment of the SA hake fishery in 2009 they received a condition on ‘Precautionary Management’. This required them to ‘develop a management strategy to address separate management for each of the two species within 2 years of certification’. However, the fishery didn’t do this, instead they did 3 other actions to ensure precautionary management and to justify why single species management wasn’t appropriate for this fishery.

The 3 actions included:

* Fund research and gather data to verify and improve the empirical model that they used to disaggregate catches into the two different species (gather data on ratios).
* Review and test the Management Procedure, including carrying out a scientific workshop.
* Carry out a qualitative cost-benefit analysis with the objective of establishing the relative biological costs, benefits and risks of joint and hypothetically separate harvesting of the two hake species. This included a stakeholder workshop to gather information about fisher behaviour and opinions. More details of this analysis is below:

The study outlined what changes would have to be made to the present hake management regime to achieve species specific management of the two species of hake in the fishery. The analysis concluded that ‘the species disaggregation of the monitoring and catching component of management as infeasible.. Thus, while the species disaggregation of TACs and the allocation of species specific IQs are both feasible in principle, it seems unlikely that MCS will be able to control these management measures.. Overall, referring to Table 4, costs outweigh benefits in the hypothetical transition to a fully species-specific management regime for South African hake, and the key facet, fully species disaggregated MCS is regarded as practically infeasible.’

Table 4.

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| --- | --- | --- | --- |
| **MANAGEMENT COMPONENT** | **Already species disaggregated?** | **Positive (i.e. benefit) of species disaggregation** | **Negative (i.e. cost) of species disaggregation** |
| 1. **Assessments** | Yes | Better reliability | Error in species splitting formula |
| 1. **Management objectives** | No | Larger TAC | Marginal return likely negative, greater bycatch component in catches |
| 1. **OMP** | Yes (\*) | Neutral | Neutral |
| 1. **TAC** | No | Neutral | Neutral |
| 1. **IQs** | No |  | External costs, administrative complexities, political turmoil |
| 1. **Monitoring and species composition of catches** | No |  | Considerable practical obstacles with huge cost implications |
| 1. **Stock Indices** | Yes | Better management | Errors in species splitting formula |

The fishery argued that ‘the current management strategy is not inconsistent with the precautionary approach. The fact that both hake stocks are managed purely on the basis of conserving the (deemed) weaker element implies compatibility with best precautionary management principles as does the robustness testing used in the Operational Management Plan selection process which is acknowledged best practice in implementing these principles.

This management strategy decision was endorsed by an independent international reviewer.’

Rationale from the assessment team as to why the condition on ‘Precaution Management’ was closed

SADSTIA continue to fund both independent empirical research and a fisheries data observer programme. The adequacy of the current level of observer coverage under the programme funded by SADSTIA has been examined and found to be satisfactory (see Conditions 8-11 at item 60 et seq).

A precautionary approach to managing the two hake species in the fishery (M capensis and M paradoxus) is explicit within the OMP (Rademeyer et al., 2010). The assessment model used is based on the distribution and current status of the two species to enable them to be managed under a single TAC, which is set to protect and ensure the recovery of the weaker of the two stocks (M. paradoxus at present). The algorithm that is used to model the two stocks and the formula for “species splitting” have been tested, and observer data are used to separate the stocks in the assessment and to set the TAC.

The aggregated catch opportunities (the TAC) are limited by the stock status (spawning biomass) of M. paradoxus at MSY, which is the target reference point for the fishery. Local scientists and external reviewers consider this represents an appropriate and precautionary approach to management of the two mixed stocks.

Stock and CPUE indices for both species continue to improve, which provides evidence that this management approach is working

The SW monkfish fishery

The SW monkfish fishery also involves two species that are fished together and are difficult to be separated on board the vessel as well. Like, the SA hake fishery, one of these species is thought to be more vulnerable to overfishing than the other.

The separate stock assessments for the two monkfish species both provide advice on a TAC for that single singles. A combined TAC is then set. In recent years the combined TAC has been less that the addition of the two single-species TACs together, however it is unclear as to how the combined TAC level is set.

Lessons learnt

The SA Hake fishery received a condition to move towards single species management. However, they were able to do a lot of work and demonstrate that they don’t need single-species management. The SW monkfish fishery, like the SA hake fishery, also argues that managing the fishery as separate species in inappropriate because the species can’t be separated when fishing. The monkfish fishery therefore could learn from the steps the SA Hake fishery took, how the hake fishery manages it’s fishery and how it has justified this management to the assessment team in the MSC assessment.

The South African Deep-Sea Trawling Industry Association funds research and a fisheries data observer program to ensure the stock assessments and models have sufficient data.

The SA hake fishery claims it’s management is precautionary because the single TAC is set to protect and ensure recovery of the weaker of the two stocks. The monkfish fishery could analyse it’s own TAC setting procedure and understand whether it is precautionary.

The hake fishery has had the strategy independently review by an external scientist and has also carried out a cost/benefit analysis on single species management vs joint management. These are both activities that the monkfish fishery could consider doing.