The South African and Namibian horse mackerel fisheries

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The South African horse mackerel

Status of the Fishery and Management

Until recently the South African fishery for adult horse mackerel was managed using a Precautionary Maximum Catch Limit (PMCL) primarily because of the difficulties in accurately estimating abundance of this highly mobile aggregating species. The total horse mackerel TAC for 2015 was 54 427 t, of which a portion (41 927 t) is allocated to the mid-water trawl sector. That is 9 % higher than last year's allocation. The remainder (12 500 t) is reserved for bycatch in the hake trawl sector.

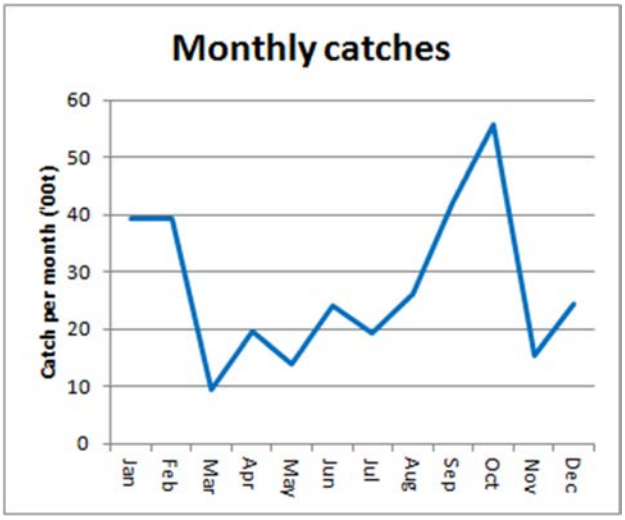

Figure 1. Average monthly catches for the *FV Desert Diamond* from 2011 – 2014. Data provided by DAFF

Although on the face of it the fishery would seem simple, it presents some complex management challenges due to the highly migratory nature of horse mackerel and uncertainty around stock structure (juvenile horse mackerel occur predominantly on the west coast and adults on the eastern Agulhas Bank). In 2013 an Operational Management Procedure (OMP) was introduced. The OMP generates a fluctuating annual Total Allowable Catch (TAC) in which the TAC slowly increases for a three year period unless there are indications from monitoring of a decline in abundance. The most recent assessment (2014) suggested a near doubling of abundance over the past decade and the prognosis was for an increase in catches in coming years. This prognosis, which is based on the current modelling, may have been overly optimistic, as the low catch rates since 2012 (Figure 2) will undoubtedly influence the next assessment of the stocks negatively.

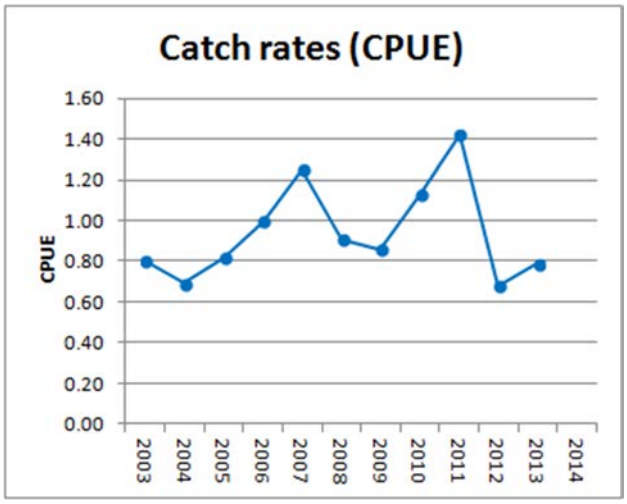

Figure 2. GLM-standardised CPUE indices for the South African Cape horse mackerel (Singh et al 2014 FISHERIES/2014/SEPT/SWG-DEM/53)

Current Research

Critical to the management decisions for the fishery are the survey biomass estimates, which are only relative estimates and are thought to under-estimate the total biomass. The OMP is

designed to test the response of the mid-water fishery by cautiously allowing for an increase in TAC to test the level of catch which the resource can sustain. The OMP will however also respond if indices of resource abundance show adverse trends by generating lower TACs In the long term. It is also hoped that the DAFF research vessel *FRS Africana* will be able to resume the historical hydro-acoustic surveys of horse mackerel so that a comparison with bottom trawl surveys can be made and the extent of the negative bias in the current estimates of abundance better estimated.

Current scientific opinion is that the juvenile horse mackerel on the South African west coast migrate southwards and recruit to the adult stock off the south coast. The juveniles are caught as bycatch in the small pelagic purse-seine fishery and this bycatch is strictly controlled through Precautionary Upper Catch Limits (PUCLs). This then ensures adequate recruitment to the mid-water trawl fishery and aims to ensure the sustainability of the stock as a whole. Currently, a PUCL of 18 000 tonnes has been allocated to the purse seine sector for the next three years. This means that the amount of horse mackerel bycatch "available" for any given year is 18 000 tonnes less the bycatch taken in the two preceding years. This is to allow reasonable flexibility to the industry to adapt to years when the high incidence of mixed-species shoals makes it very difficult for the pelagic fleet to avoid juvenile horse mackerel. The PUCL for 2015 was set at 12 233 tonnes using this rule.

The small pelagic surveys undertaken by the *MV Compass Challenger* in November 2014 however did not show encouraging signs of juvenile horse mackerel with only patchy distributions (Figure 3) in the bay areas on the south coast and low densities on mid-shelf offshore between Cape Columbine and Cape Point (Fisheries/2014/Dec/SWG-Pel/63).

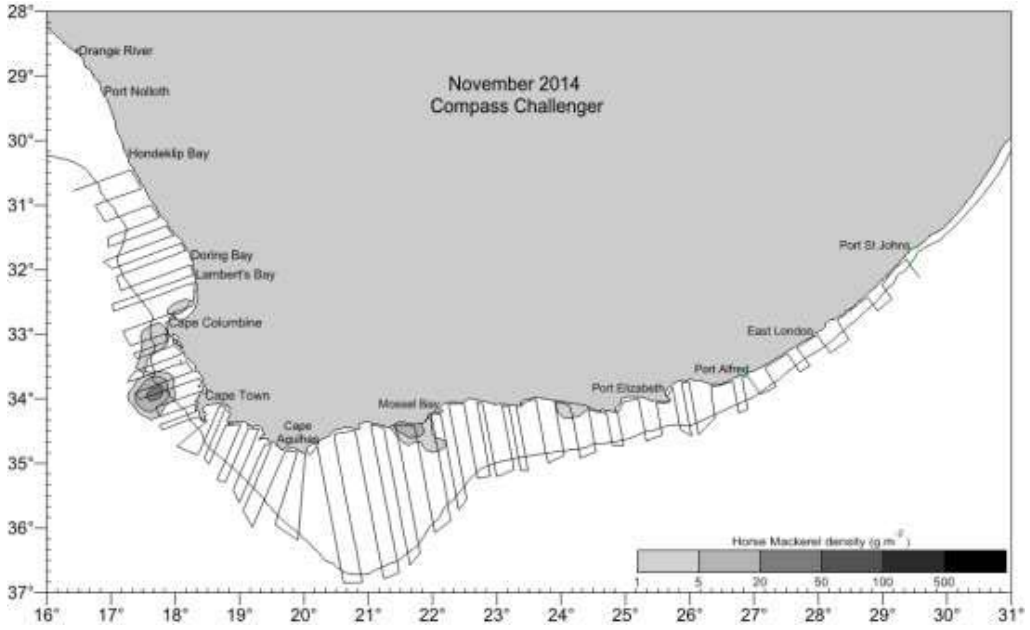

Figure 3. Distribution and density of juvenile horse mackerel in the November 2014 hydroacoustic survey for small pelagic species

Horse Mackerel Fishery in Namibian waters

Stock Structure and Species in the Benguela and Agulhas Ecosystems

Namibia exploits the same species of horse mackerel as South Africa although there are some questions around the stocks between the two countries (Figure 4). Cape horse mackerel are commercially caught in a broad area extending from the East London area on the east coast of South Africa, across the Agulhas Bank and into the Benguela region as far north as Angola. Although the fishery for adult fish in South African waters is focused on the eastern Agulhas Bank, the Namibian fishery is expedited almost entirely north of Walvis Bay towards Angola. Interestingly two other horse mackerel species overlap with Cape horse mackerel. These are Cunene horse mackerel (*Trachurus trecea*) on the northern extent of the Namibian stock (Angolan border), and "African" horse mackerel (*Trachurus delagoa*) on the eastern extent of the South African stock on the Agulhas Bank. The distribution and abundance of these two species (other than the Cape horse mackerel) largely depends on oceanic conditions and the intrusions of warm water and are not considerations in the assessments of the Namibian and South African fisheries, which target only Cape horse mackerel.

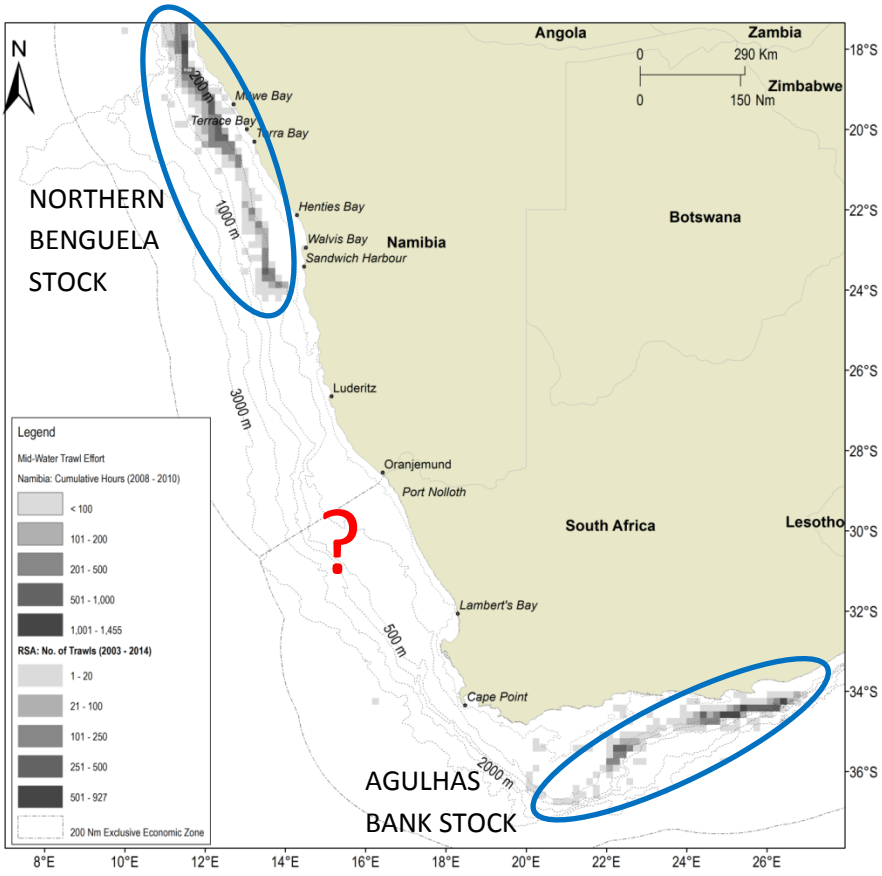

Figure 4. Extent of the mid-water trawl fisheries for Cape horse mackerel in Namibian and South African waters showing the two distinct stocks in Namibia and South Africa

Horse mackerel, along with hake, is the mainstay of the Namibian commercial fisheries. Since 1997 the biomass estimates have shown that horse mackerel abundance is highly variable (Figure 5). In some years biomass is as high as 1.8 million tonnes (Figure 5) and in others as low as 500 000 t. The management strategy for the fishery has remained fairly consistent with the allowable catch as high as 500 000 t in 1994, but mostly in the 300-400 000 t range. These values indicate that the management strategy aims to harvest about 30% of the adult biomass each year. The effort level (number of boats) has also fluctuated much along the same proportions as the biomass with up to 27 vessels in the late 1990s and currently at 15. The prognosis for the fishery is for the biomass to be sustained at about 1.4 million tonnes with a TAC of about 350 000 t – a scenario which would stabilise the fishery. As in South Africa, Namibia also permits a small juvenile horse mackerel component to be taken by their small pelagic purse seine fishery targeting sardine which currently approximates 15 000 t.

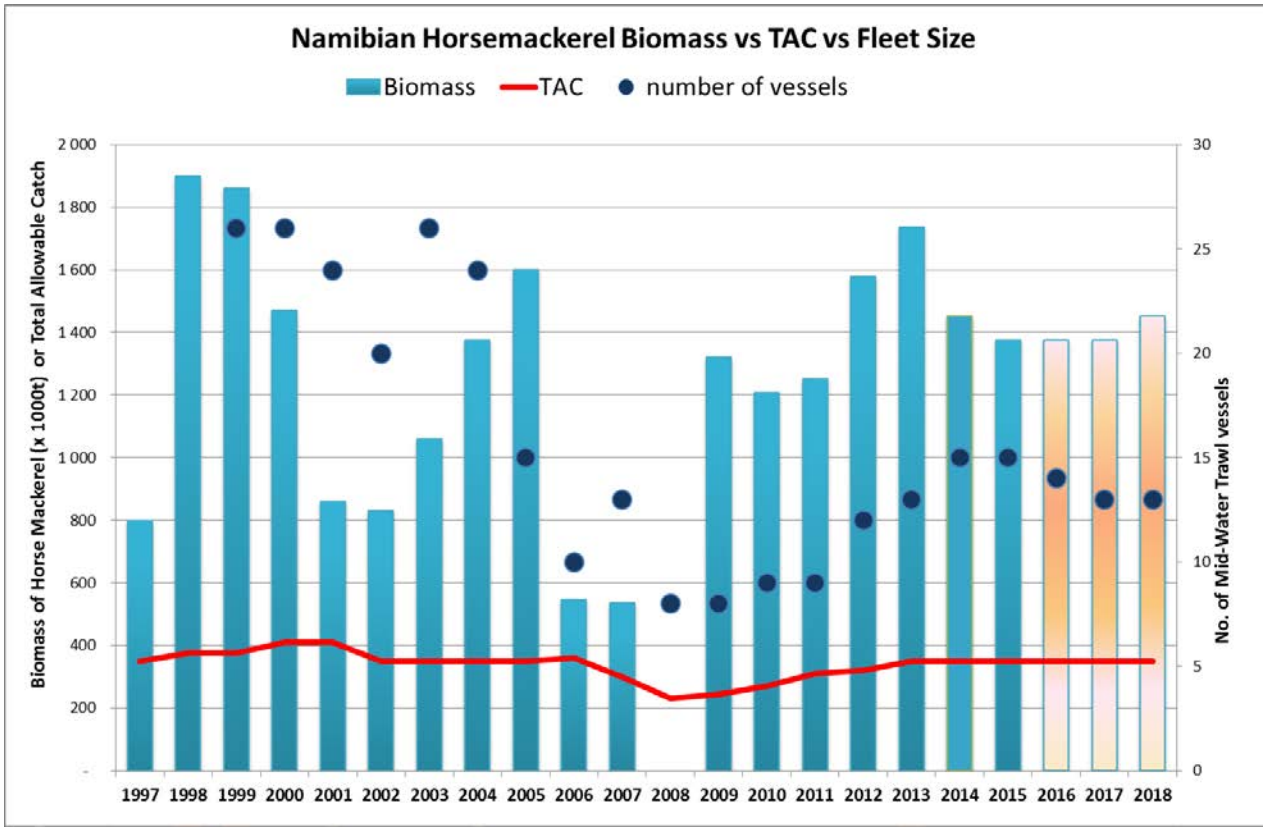

Figure 5. Historical biomass estimates, Total Allowable Catches and fleet size in the Namibian horse mackerel fishery (mid-water only)

Food for Thought – Stocks Status and Future Management

Much research has been conducted on horse mackerel in the northern and southern Benguela. In particular the question around the number of stocks has never really been fully understood. As Figure 4 shows there are clearly two focal areas for the adult fishery – in the south on the Agulhas Bank and in the northern Benguela. Adult horse mackerel historically also occurred in large volumes on the west coast of South Africa in the southern Benguela.

The resource supported a large purse seine fishery in the early 1950s with catches exceeding 100 000 tonnes in some years. Purse seine catches subsequently declined rapidly, while those from the demersal and midwater trawl fisheries increased, spiking at over 80 000 tonnes in the late 1970s. The high abundance on the South African west coast has long since declined and the species currently occurs in higher abundance on the south coast than on the west. The management strategies for horse mackerel in the two countries are quite different – this is understandable to some extent as the dynamics between the three ecosystems (Agulhas, southern and northern Benguela) are quite different. Also in Namibia the fishery permits a much larger effort level (15 vessels) while in South Africa there is only one mid-water directed vessel (the Oceana vessel *FV Desert Diamond).*