

Status and management of the South African horse mackerel resource – September 2016

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Cape horse mackerel *Trachurus capensis* (or “maasbanker”), is a semi-pelagic shoaling species that is found on the continental shelf from the South African Wild Coast in the east and into the Benguela ecosystem as far as southern Angola. In Angolan waters a second (and similar species), the Cunene horse mackerel (*Trachurus trecae*) dominates and on the South African east coast, the African horse mackerel *T. delagoa* replaces the Cape horse mackerel, but is much less abundant. Cape horse mackerel is, however, the target species for the main commercial fisheries for horse mackerel in both South African and Namibian waters. Horse mackerel shoal in large numbers with a distinct diurnal vertical migration. They stay close to the seabed during the day (when they are targeted by bottom trawlers) and rise off the seabed at night where they disperse to feed mostly on plankton in the midwater. It is at these times that the adults are targeted by midwater trawls. The midwater trawl fishery is restricted to the south coast, east of 20° E (the Agulhas Bank). This spatial management measure is intended to constrain the fishery to catching only adult horse mackerel while protecting juvenile horse mackerel, which are found inshore and predominantly on the west coast.

As a result of the semi-pelagic behaviour of horse mackerel and because it can be distributed throughout the water column, the biomass of the species cannot be estimated reliably using either hydro-acoustic surveys or demersal swept-area surveys in isolation. Fish in close proximity to the seabed are accessible to demersal swept-area surveys but are not acoustically detectable, whereas fish in the water column can be detected by hydro-acoustic surveys but are not accessible to demersal trawl gear. These factors make it difficult to assess the status of the resource accurately and improved direct survey indices of abundance using a combination of the two techniques are needed to enhance the assessment of the resource. Plans to undertake further research into such combined methods have been put in place and the research vessel *RV Africana* conducted an experimental survey on the south coast in July 2016.

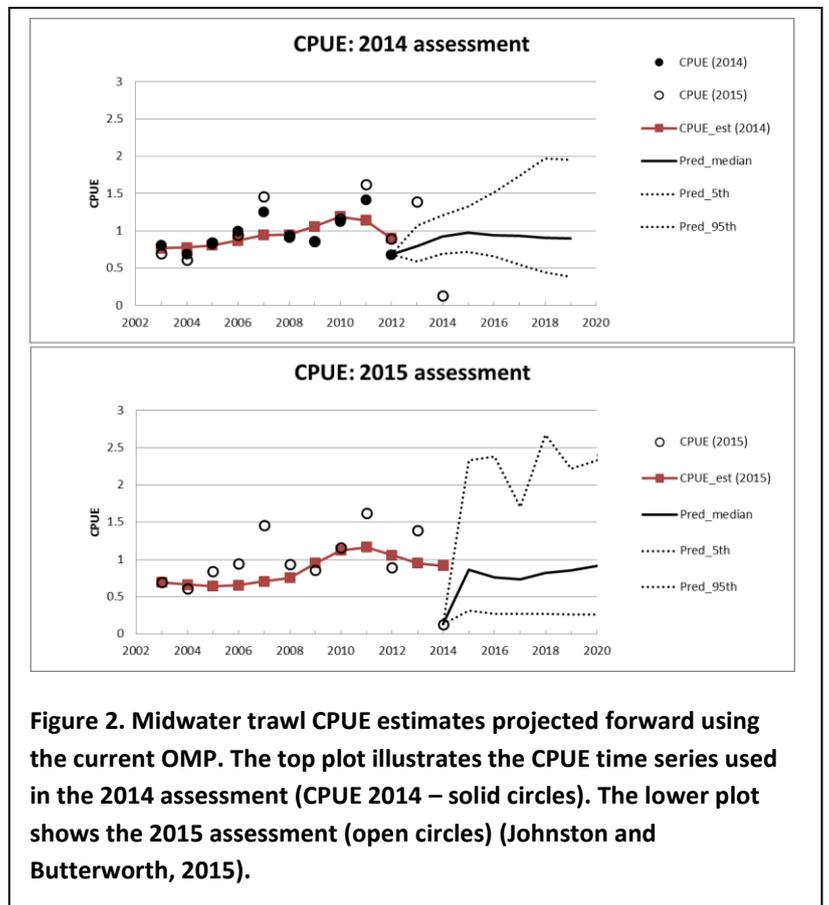
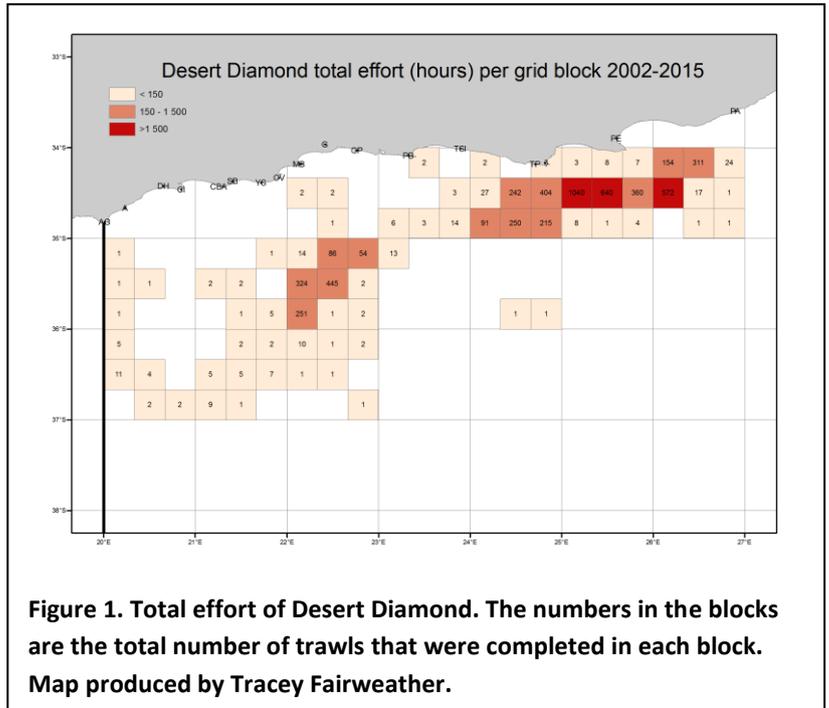
Management framework for the South African horse mackerel resource

The Fisheries Management Branch (FMB) of the Department of Agriculture, Forestry and Fisheries (DAFF) is responsible for research and monitoring of the horse mackerel stock, which tasks are undertaken primarily through research surveys, observer deployments and monitoring commercial fishing catches and effort. The Demersal Scientific Working Group (DSWG) provides advice and recommendations for management in order to ensure the sustainable utilisation of South Africa's horse mackerel resource. Apart from the spatial management already mentioned, other management measures for the fishery that aim to ensure the sustainability of the horse mackerel resource include total allowable catches (TACs) for the midwater trawl fishery, precautionary upper catch limits (PUCLs) for the small pelagic fishery and a total allowable bycatch (TAB) for the demersal trawl fishery. Recommendations on allowable catches of horse mackerel are derived from application of an Operational Management Procedure (OMP), as in the cases of the hake, anchovy and sardine fisheries. The horse mackerel OMP provides rules to guide the determination of an annual, fluctuating TAC, which allows for increased catches during periods of high abundance and a decrease in TAC when abundance decreases.

Fishery Performance in 2015 and 2016

The midwater trawl fleet consists of a single, large midwater trawler (the *FV Dessert Diamond*) that targets horse mackerel (Figure 1). There are also a number of smaller hake trawlers that carry dual hake and horse mackerel rights that enable them to target horse mackerel with midwater trawl gear opportunistically, in addition to fishing for hake at other times using demersal trawl gear.

An updated assessment of the horse mackerel resource was conducted in 2015. Using commercial catch-per-unit-effort (CPUE) as the primary index of abundance of the resource, the results indicated that abundance in 2014 was much lower than the lower limit that had been estimated in the 2013 assessment (Figure 2). With the limited data and information available, the reason for this apparent decline is unknown. It could be a reflection of reduced availability (catchability), which would result in a lower CPUE, or it could be a decline in resource abundance, possibly from a short term increase in natural mortality. Additional analyses were therefore conducted that explored a suite of possible management measures from which the DSWG agreed on those that were the most appropriate given the variability and related uncertainty of the stock dynamics. This strategy involves the implementation of a “package” of measures that incorporates a reduction in the TAC for the directed midwater trawl sector together with effort limitation. The approach is precautionary and takes into account the worst case scenario but avoids taking an extreme management response. For example, if the resource is experiencing a large “once-off” increase in natural



mortality, it would be necessary to reduce future catches to approximately 10 000 tonnes per annum for the next 10 years in order to ensure a gradual recovery of the spawning biomass to an acceptable level. Catches higher than that would result in stock collapse. However, in order to avoid that drastic step, the implementation of an effort restriction of 250 days per annum, in addition to the TAC, introduces a safety margin. This is because if the resource abundance is low, there would inevitably be lower catch rates and the annual catch attainable in 250 days would automatically decline. With the effort limitation in place, spawning biomass is expected to recover (albeit at a slower rate) even if the TAC remains at 38 658 tonnes, the amount indicated by the OMP for 2016.

Ecosystem considerations

The impact of midwater trawling for horse mackerel on the ecosystem is not well understood but a recent analysis of 10 years of at-sea observer data indicated that the bycatch is not substantial (Reed, 2015). A bycatch rate of 6.9% by weight of the total catch was estimated. This is low compared to other South African trawl fisheries but similar to other midwater trawl bycatch rates around the world (Reed 2015). Large fauna bycatch species include Cape fur seals (*Arctocephalus pusillus*), sharks (15 species), sunfish (*Mola mola*) and cetaceans (two species), most of which have a low survival rate but some are released alive. Those that are dead are converted directly into fishmeal. Seabird bycatch used to be a concern but because the midwater trawl fishery does not discard offal or bycatch overboard and bird scaring lines are required as per the permit conditions (Figure 3), the overall impact to seabirds by the fishing operation is believed to be minimal.



Figure 3. Image of the tori lines showing the seabirds away from the trawl warp.

For 2016, the Fisheries Branch provided several recommendations in an attempt to reduce ecosystem concerns. These include:

- **All vessels in the fleet should fly tori lines (bird scaring lines – Figure 3) while towing fishing gear in order to mitigate seabird mortalities through strikes on warps.** These lines have been very effective in reducing seabird interactions during fishing operations;
- **The DAFF scientific Observer Programme should be reinstated as soon as possible.** Currently the industry have taken it upon themselves to maintain 100% observer coverage to collect data required for evaluating and managing the levels of bycatch. Observer coverage is also critical for collecting horse mackerel catch-at-length data (an input to the assessment model) and catch rates at the level of individual trawls;
- **An effective bycatch mitigation device should be developed to reduce the impact on species of potential conservation concern.** Although preliminary results indicate that catches of species of conservation concern are on average relatively low, it has been noted that there have been isolated events of large short-term catches of certain species of concern, such as marine mammals, large pelagic fish species and sharks. The impact of such

“once off” large fishing mortalities has yet to be evaluated, but may be more severe than the overall average would suggest;

- **Resources should be made available to ensure that a dedicated horse mackerel abundance survey** is conducted by the *RV Africana* during 2016 and in the future.

Currently the Oceana midwater trawler *FV Desert Diamond* is also doing trial trawls west of 20° E to test the availability of horse mackerel. DAFF have set conditions for this spatial shift in effort that includes 100% observer coverage and strict limitations on bycatch. This effort will also contribute further to the understanding of the stock dynamics of horse mackerel.

References

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