# Oceana Sustainability Report 2023

# Status and Management of

# South African Hake

# Oceana Hake Sustainability Report

2023

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## Overview

South African hake comprises two distinct species, the shallow-water Cape hake (*Merluccius capensis*) and the deep-water Cape hake (*M. paradoxus*), which are targeted by the deep-sea trawl, inshore trawl and hake longline fisheries (Durholtz, 2022). Hake is also caught in small amounts by handline fishers. Hake remains the most economically significant marine resource in South Africa.

Since 1991, the management of hake has relied on Operational Management Procedures (OMPs) – a sophisticated method that encompasses data collection, analysis, and decision rules (Durholtz, 2022). These procedures lead to the calculation of the Total Allowable Catch (TAC), crucial for sustainable management. Key data includes commercial Catch-Per-Unit-Effort (CPUE) indices and abundance indices from demersal research surveys (Durholtz, 2022).

Recent developments in the hake OMP have also aligned with the stringent standards set by the Marine Stewardship Council (MSC) for the certification of the South African hake trawl fishery. This certification emphasizes the need to maintain hake populations near or around their Maximum Sustainable Yield (MSY) thresholds (Durholtz, 2022). The OMPs cater for “Exceptional Circumstances” by including provisions which regulate procedures to be followed in the event that monitoring data falls outside of the expected range simulated in the development of the OMP (Durholtz, 2022). These commitments underscore responsible and sustainable fisheries management which is a core principle of the MSC certification process. The certification has delivered significant socio-economic advantages to the fishery by granting access to global markets where there is a growing demand for eco-labelled seafood products (Lallemand et al. 2016). Efforts to promote sustainability in the South African hake industry extend to adopting fishing practices that reduce bycatch and minimize environmental impacts (Durholtz, 2022). Additionally, initiatives support local communities through community-based projects, education, and skills development, contributing to the socioeconomic sustainability of coastal regions. This dual approach not only ensures the protection of the broader marine ecosystem but also supports the socioeconomic sustainability of coastal regions, making strides toward a more responsible and balanced hake fishing industry.

The management objectives outlined in OMP-2022 depend on enforced operational limits set for the hake-directed fisheries. For example, the inshore trawl grounds span the area between Cape Agulhas in the west and the Great Kei River in the east. Vessels engaged in the inshore fishery must adhere to a maximum length limit of 35 meters. Typically, the inshore fishery conduct trawling activities within the conventional "inshore" region, defined as waters shallower than the 110-meter isobaths. However, they are not constrained from operating in deeper waters if needed. In contrast, vessels participating in the deep-sea trawl fishery are prohibited from operating in water depths less than 110 meters or within 20 nautical miles of the coastline, whichever distance is greater (Durholtz, 2022). The hake longline sector is limited by the number of hooks it can set on a given day and has a smaller proportion of the TAC allocated (~6.55%) to it, acknowledging uncertainties that still remain regarding the targeting of untrawlable areas and larger size class fish. All three sectors are also “effort managed” through the allocation of fishing rights, vessel numbers, vessel size and horse power.

The TAC represents the maximum quantity of fish or other marine resources that can be legally harvested within a specific region or fishery, serving as a critical management tool for sustainable fisheries. The Total Allowable Effort (TAE) is applied in the trawl sector through a limit on the number of sea days permitted per vessel according to its TAC allocation and horse power, and through hook limits in the longline sector. Each year permit conditions are updated to reflect revised TACs and other updated management measures. The TAC values for the hake resource for the years 2019 to 2023 are presented in Table 1.

**Table 1: Annual TAC for the South African hake fishery from 2019-2023**

| Year | Total Allowable Catch (tons) | Total Catch all sectors (tons) |
|---|---|---|
| 2019 | 146,431 | 129,896 |
| 2020 | 146,400 | 141,873 |
| 2021 | 139,109 | 150,547* |
| 2022 | 132,154 | Pending |
| 2023 | 138,760 | Incomplete year |

* Note that the over catch relative to the TAC in 2021 is due to the 15% roll over that was implemented by the Department in 2021 to alleviate the negative impacts of the COVID pandemic on the hake fisheries during 2020.

This data reveals a fluctuating trend in TAC allocations over the past five years, with a general decrease from 2019 to 2022, followed by a modest increase in 2023. In 2023, the TAC projection based on OMP-2022 is 138,760 metric tons, reflecting a 5% increase from 2022. Abundance indices suggest favourable trends, illustrating responsible management.

## TAC Recommendations for 2023 (Based on 2022 OMP)

In compliance with the regulations set forth in OMP-2022, the initial calculation for the 2023 TAC for South African hake stood at 153,460 tons (Ross-Gillespie and Butterworth, 2021, 2022a). However, OMP-2022 mandates certain constraints to prevent drastic fluctuations in annual catch limits (Ross-Gillespie et al. 2021). Specifically, these constraints stipulate that the TAC may increase by a maximum of 5% or decrease by a maximum of 5% annually, unless the average biomass index for hake, falls below a critical threshold (Ross-Gillespie et al. 2022a). At present, the average biomass index registers at a healthy 0.948, surpassing the threshold value of 0.75. Therefore, the allowable increase is applied, resulting in a finalized TAC of 138,760 tons for 2023 - a 5% increase from the 2022 TAC of 132,154 tons (Ross-Gillespie et al. 2022a). These adjustments ensure the sustainable management of the South African hake fishery while taking into account the current health of the hake population (Butterworth and Ross-Gillespie, 2020a, 2020b, 2020c ; Ross-Gillespie et al. 2021, 2022a).

It's worth mentioning that in 2022, the summer west coast research survey was conducted, but regrettably, the autumn south coast research survey did not take place (Ross-Gillespie et al. 2021). However the survey index for *M. paradoxus* along the west coast closely mirrors the 2020 estimate, while the index for *M. capensis* on the west coast surpasses the 2020 value (Ross-Gillespie et al.

2022a). Promisingly, a thorough assessment of the abundance indices demonstrates either a positive enhancement or, in certain cases, a generally steady trend when compared to recent-year data. Furthermore, all four CPUE indices for 2021 exhibit an upturn from their 2020 counterparts, signalling a positive trend (see Figure 2).

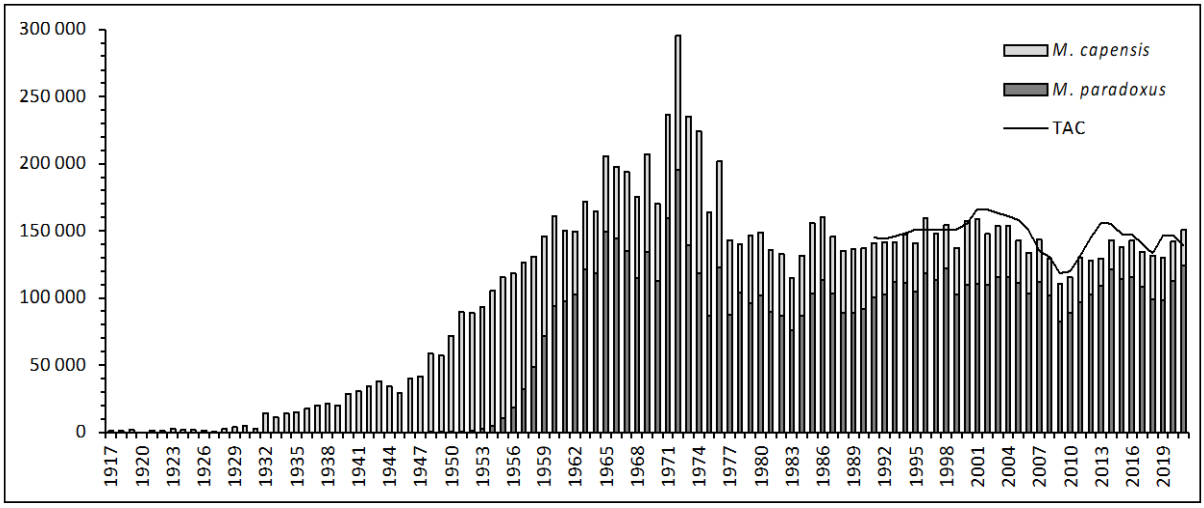


**Figure 1: Total catches ('000 tons) of Cape hakes split by species over the period 1917 – 2021 and the TAC set each year since the implementation of the OMP approach in 1991. Prior to 1978, where the data required to allocate the catch by species are not available; the split is calculated using an algorithm that assumes 1958 as the centre year for the shift from a primarily *M. capensis* to a primarily *M. paradoxus* deep-sea trawl catch. Note that the over catch relative to the TAC in 2021 is due to the 15% roll over that was implemented by the Department in 2021 to alleviate the negative impacts of the COVID pandemic on the hake fisheries during 2020 (Durholtz, 2022).**

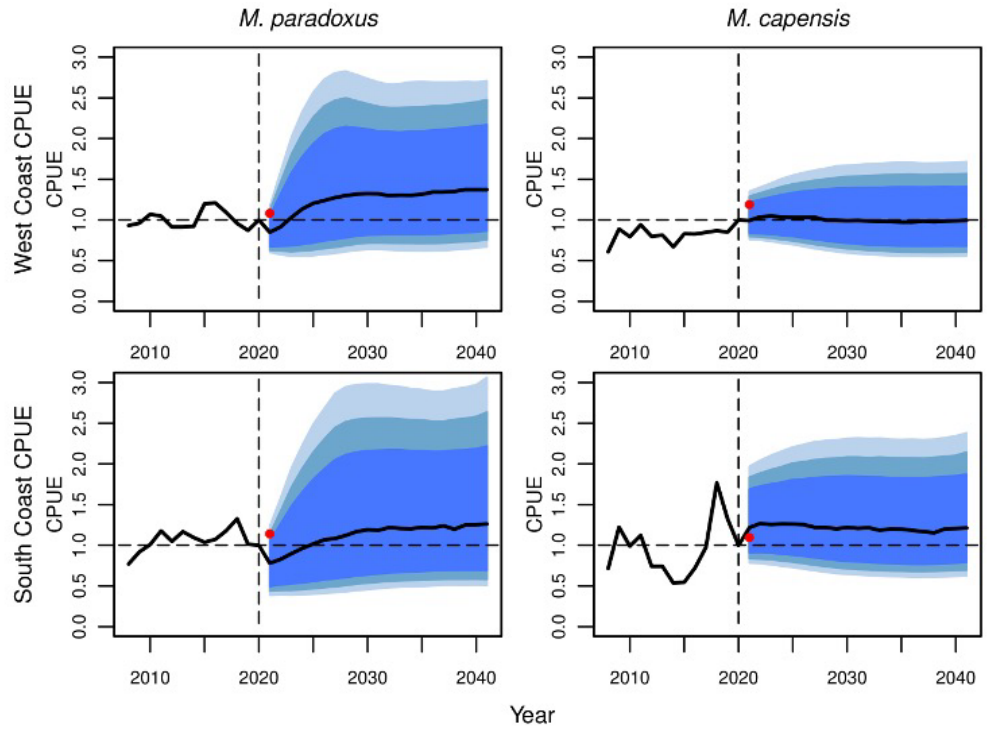


**Figure 2: 95, 90, 80% PE and median for the projected GLM-standardised CPUE for *M. paradoxus* and *M. capensis* for the updated RS under OMP-2022. The red dots show the 2021 CPUE indices, standardised relative to the 2020 value in the updated GLM series (Ross-Gillespie et al. 2022b).**

The overarching management objectives, as delineated in OMP-2022, encompass an empirical approach to responsible fisheries management (Ross-Gillespie et al. 2022a). These objectives include maintaining the spawning biomass of both hake species at levels hovering around or slightly above the MSY, with the level being the pivotal reference point essential for MSC certification. Additionally, it is crucial to ensure that the median spawning biomass of *M. paradoxus* remains above the 2007 level estimated by the Reference Set of Operating Models, a threshold not only critical for maintaining resource viability but also indispensable for MSC certification.

The OMP-revision in 2022 attempted to incorporate hake longline CPUE (Catch Per Unit Effort) data. Subsequent robustness testing revealed that the current management procedure can effectively accommodate anticipated future catch scenarios, thereby instilling a degree of confidence (Durholtz, 2022; Ross-Gillespie et al. 2022a). Further investigation of mismatch between predicted and observed CPUE is needed before the dataset can be officially included in the model.

The Comprehensive Management Procedure (CMP), officially adopted as OMP-2022 by the Demersal Scientific Working Group (DSWG), encompasses a comprehensive set of specifications aimed at guiding the sustainable management of the South African hake resource. These key provisions include the following:

- **Total Allowable Catch (TAC) for 2023:** The establishment of a TAC set at 138,760 tons for 2023, reflecting a 5% increment from the preceding year's allocation.
- **TAC Maintenance in 2024:** A commitment to maintaining the 2024 TAC at a minimum of 138,760 tons, precluding any reductions below the 2023 allocation.
- **Calculation of TAC for 2025 and 2026:** The determination of TAC for these years involves the summation of species-specific catch limits, based on deviations from recent abundance data compared to predefined target levels.
- **Adjustment of Tuning Parameters:** A modification of the $J_0^{spp}$ tuning parameters within the OMP algorithm, reducing them by 0.40 compared to those used in the prior hake management plan (OMP-2018).
- **Annual Catch Cap:** The imposition of a "hard cap" set at 160,000 tons per annum for the period spanning 2023 to 2026.
- **Stable TAC Changes:** A restriction limiting annual changes in TAC to a maximum of 5%, whether in an upward or downward direction.
- **Resource Safeguard:** The presence of a "safeguard" rule that can override the percentage decrease constraint in cases of significant resource decline, dependent on the status of *M. paradoxus* in relation to predefined thresholds.
- ***M. capensis* Abundance Threshold**: The establishment of a threshold for *M. capensis* abundance, triggering actions to limit its catch while safeguarding *M. paradoxus*.
- **Exceptional Circumstances:** Provision of guidelines for addressing "Exceptional Circumstances," ensuring adaptable management strategies in response to unforeseen deviations in future monitoring data during the development of the OMP.

## Ecosystem Considerations

South Africa's commitment to an Ecosystem Approach to Fisheries (EAF) involves extending fisheries management beyond single-species focus to encompass the entire marine ecosystem. In 2006, the hake fishery's permit conditions included an Ecosystem Impacts of Fishing section, marking a significant shift towards EAF implementation (Durholtz 2022). Current permit conditions feature measures to reduce fishing's ecosystem impact, including seabird conservation through tori lines and offal management, seabed protection via gear restrictions, by-catch reduction strategies, and a "move-on" rule for Vulnerable Marine Ecosystem (VME) species (Durholtz 2022). Furthermore, efforts are directed at minimizing kingklip overharvesting and developing a management plan for the inshore trawl sector to reduce by-catch (Durholtz 2022). Fishing capacity is regulated, and stock assessments for key by-catch species are under development. To maintain MSC certification, the "Trawl Ring Fence" initiative, preventing trawling expansion into new areas until seabed impacts are better understood, was introduced in 2008 and formally incorporated into permit conditions in 2015 (Durholtz 2022). In 2022/23, American import requirements were updated such that any country wishing to sell product into the USA was required to show that they had in place US-equivalent monitoring programs in place to report on marine mammal bycatch. Fortunately in the hake sectors, long-term industry-funded at-sea observer programs are now the best-practice standard. Permit conditions have also bee updated to emphasise the need for skippers to report any interactions with cetaceans and seals.

Additionally the companies operating within the industry has been working closely the Responsible Fisheries Alliance. The Responsible Fisheries Alliance (RFA), a non-profit organization consisting of three prominent members of the South African Deep-Sea Trawling Industry Association (SADSTIA) - I&J, the Oceana Group, and Sea Harvest – exemplifies the hake industry commitment to fostering the development of healthy marine ecosystems that underpin a robust and sustainable seafood industry in southern Africa (Responsible Fisheries Alliance, 2017, 2023).

The RFA has been active for over a decade and is currently engaged in several significant projects and activities to promote responsible fishing practices and sustainable fisheries management in South Africa (see Table 2). One of their key initiatives involves developing an electronic data management model for fisheries data collection, modernizing and streamlining the reporting process to provide decision-makers with accurate and timely data for improved fisheries management (RFA, 2017). Additionally, the RFA is conducting research to assess the impact of seismic survey activities on fish populations and the marine environment, aiming to engage with industry and regulators to implement mitigation measures. They are actively monitoring and studying the bycatch of endangered, threatened, and protected species in commercial fisheries, contributing to conservation efforts (RFA, 2017). Furthermore, the RFA is focused on influencing South Africa's fisheries policy framework to ensure alignment with responsible and sustainable practices through engagement with stakeholders and policymakers.

**Table 2: Summary of the RFA projects relevant to the South African hake fishery from 2010 until present day (Responsible Fisheries Alliance, 2017, 2023).**

| Area of Interest | Project title | Consultant | Date |
|---|---|---|---|
| | Review of the Offshore Resources Observer | Capfish (Monique Boucher) | 2010 |

| Area of Interest | Project title | Consultant | Date |
|---|---|---|---|
| ***Promoting evidence-based decision making*** | Programme and the observer data: 2002-2009 | | |
| | Establishing an electronic data management model in South African fisheries | OLRAC SPS (Dr Amos Barkai and Dr Philippe Lallemand) | 2014 |
| | Electronic data management implementation project | DAFF, I&J, RFA | Ongoing |
| ***Seabird mortality bycatch mitigation*** | Vessel Management Plan to reduce seabird mortality | Barrie Rose | 2011 |
| | Rory Lines: a silver lining for seabirds in South Africa's demersal trawl fisheries | Percy FitzPatrick Institute of African Omithology, UCT (Edward Rice) | 2012 |
| ***Inshore Trawl Bycatch*** | Potential bycatch mitigation measures in the south coast inshore trawl fishery | Marine Research Institute, UCT (Prof Colin Attwood) and Botany Department, NMMU (Prof Amanda Lombard) | 2011 |
| | Feasibility of an industry-managed bycatch "PUCL-quota" system for the inshore trawl fishery | Marine Research Institute, UCT (Prof Colin Attwood and Jessica Greenstone) | 2013 |
| ***African Penguins*** | How much energy do African penguins extract from the sea? | Animal Demography Unit, UCT (Prof Leslie Underhill and Dr Antje Steinfurth) | 2011 |
| | African penguins' prey abundance and distribution at a small spatio-temporal scale | Percy FitzPatrick Institute of African Omithology, UCT (Dr Lorien Pichegru and Alistair McInnes) | 2013 |
| | Further evaluations of factors pertinent to evaluating penguin fishery interactions | Marine Resource Assessment and Management Group, UCT (Prof Doug Butterworth) | 2014 |
| | Using holistic datasets for modelling penguin-fishery competition | Birdlife SA (Dr Ross Wanless) | 2014 |
| | Foraging strategies and habitat utilisation of the African penguin, *Spheniscus demersus*, | Percy FitzPatrick Institute of African Omithology, UCT (Dr Antje Steinfurth) | 2015 |

| Area of Interest | Project title | Consultant | Date |
|---|---|---|---|
| | around Robben and Dassen Islands | | |
| | "Blue sky"Workshop: new ways of thinking about the West Coast ecosystem and how penguins interact with other elements | Birdlife SA (Christina Hagen) | 2015 |
| | Technical support and facilitation of island closure experiment analyses | DAFF (Janet Coetzee) | 2016 |
| ***Legislative framework*** | Informing effective policies for responsible fisheries in South Africa | Rhodes University (Prof Kevem Cochrane) | 2014 |
| | Understanding how best to affect the fisheries policy framework | RFA | 2017 |
| ***Benthic protection*** | WWF-SA/RFA Marine Mining Engagement Strategy | Carolyn Ah Shene-Verdoorn | 2014 |
| | Valuing the socio-economic contribution of fisheries and other marine uses in South Africa | Environmental Economics Policy Research Unit, UCT (Kerri Brick and Reviva Hasson) | 2016 |
| | Assessing the impact of seismic survey activity | Dave Russell Fisheries Consultancy cc (William David Russell) | 2017 |
| ***Broad EAF projects*** | Benchmarking South Africa's fisheries | Advance Africa Management Services cc (Prof Tom Hecht) | 2015 |
| | Developing a Code of Conduct for Responsible Fisheries in South Africa | CapFish (Dave Japp and Melanie Smith) | 2015 |
| | A decade of the ecosystem approach to fisheries in South Africa, 2005-2015 | Marine Research Institute and Department of Biological Sciences, UCT | 2016 |
| | Monitoring of endangered, threatened and protected species in South Africa fisheries | Marine Research Institute, UCT (Prof Colin Attwood and Jessica Greenstone) | 2017 |

| Area of Interest | Project title | Consultant | Date |
|---|---|---|---|
| ***Offshore trawl bycatch*** | Improving the WWF-SASSI sustainability rating of key non-target species from the hake offshore trawl sector | WWF-SA (Jessica Greenstone) | 2015 |
| ***Capacity development*** | Responsible fisheries training programme | RFA Training Working Group | Ongoing |
| | Responsible fisheries training posters | Strika Entertainment | Ongoing |
| | Updating the RFA training materials | Capricorn Marine Environmental | 2023 |

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