



Oceana Sustainability Report 2020

Status and Management of

South African horse mackerel



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Cape horse mackerel in South Africa and Namibia

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Stock distribution and biology

Horse mackerel (*Trachurus capensis*) is a semi-pelagic shoaling species that extends from the continental shelf along the South African Wild Coast in the east and into the Benguela ecosystem as far as southern Angola. In Angolan waters a second but similar species, the Cunene horse mackerel (*Trachurus trecae*) dominates whereas on the Wild Coast, the African horse mackerel *T. delagoa* replaces the Cape horse mackerel but is much less abundant. Cape horse mackerel the target species for the main commercial horse mackerel fisheries in both South African and Namibian waters and is considered a single stock (albeit managed separately). Adult fish (>17cm) are found mainly near the continental shelf break whereas juveniles (<17cm) occur inshore. 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 trawlers.

Adult horse mackerel in Namibia are predominantly found in the north. In South Africa the adults occur along a narrow band along the continental shelf edge on the South Coast of South Africa (Figure 1). It is possible (but not confirmed) that the area between the two countries is the main spawning recruitment area for the Cape horse mackerel and that the maturing juveniles migrate northward towards Angola and southward towards the Agulhas Bank. The inshore grounds and bay areas throughout the region are thought to be nursery grounds. Another theory is that a secondary spawning area occurs on the Agulhas Bank and juveniles move up to the West Coast nursery areas and as they grow they move back south and east (Figure 1).

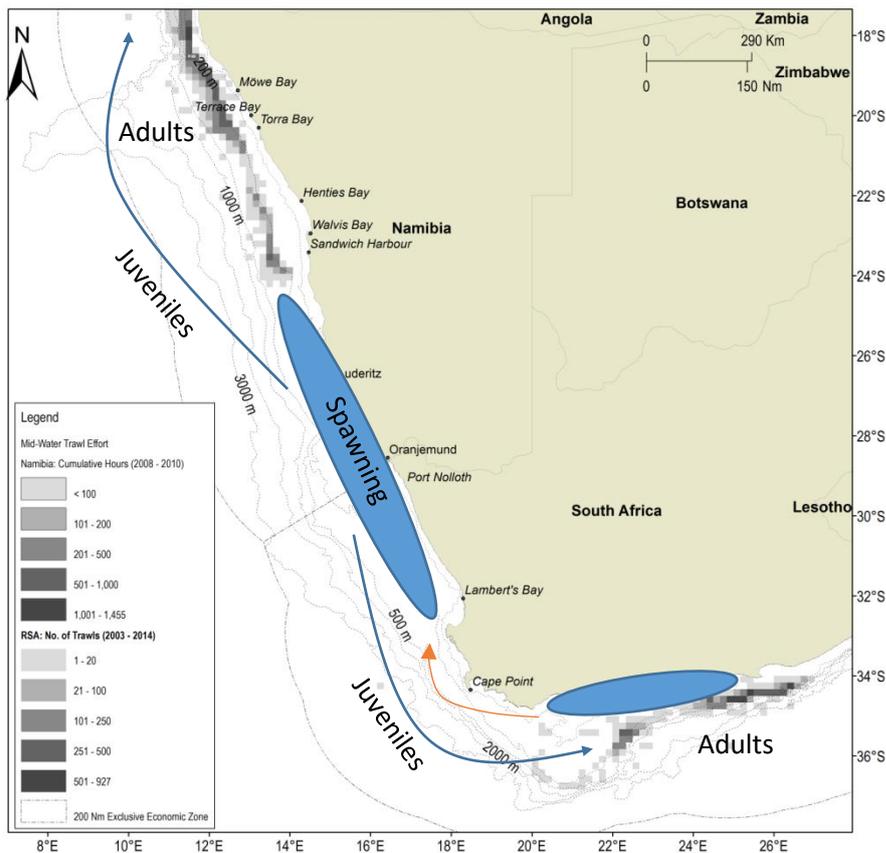


Figure 1. Distributions of adult horse mackerel and the migration of juveniles from the spawning grounds.

Commercial fisheries

Cape horse mackerel are either converted to fish meal on-board the vessel or sold as a frozen, whole product. Adult horse mackerel catches in South Africa are dominated by a single, large midwater trawler the *FV Desert Diamond*, landing approximately 75% of the allowable catch allocated to trawl (Figure 1). A number of small dual rights owners in the demersal hake-directed trawl sector also target the adults. These two fleets combined were allocated an allowable catch of 27 670 tonnes for 2020 (same level as 2019). A proportion of the allowable catch for adults (8 455 tonnes, same as 2019) was also set aside as a bycatch reserve in the hake trawl sectors (an 80:20 ratio between deepsea and inshore). Juvenile horse mackerel are caught as a bycatch in the purse-seine fishery targeting anchovy and sardine and the Precautionary Upper Catch Limit (PUCL) for this fishery was set at 12 000 tonnes in 2020 (same as last year).

Up until recently the *FV Desert Diamond* was restricted to operate only on the South East Coast (east of the 20 °E longitude) but as a result of a decline in catches (in this area) in 2015, the vessel made a case seeking permission to extend the existing fishing grounds to include the entire West Coast (Figure 2). Because of the socio-economic implications, Department of Environment, Forestry and Fisheries (DEFF) management, in consultation with their scientists in the Demersal Working Group, agreed to

relax the spatial restrictions under condition that the vessel only operates in waters deeper than 110m on the South East Coast and deeper than the line drawn between the reference points in Figure 2.

Although the vessel is now licensed to operate on the West Coast, in the last year the majority of trawls (98%) still were made on the South-East Coast where horse mackerel have historically been abundant. Concerns regarding possible increased bycatch of non-target species on the West Coast were raised, necessitating restrictions on key bycatch species and further management responses such as move-on rules. If these limits are reached or the vessel doesn't comply with the move-one rules, fishing would be suspended immediately and the historical spatial limits reinforced i.e. 20°E restriction. For this reason, it is unlikely that the vessel will make a permanent move to the West Coast area of operations as the adult biomass is generally more dispersed there and there is a higher likelihood of triggering the bycatch move-on rule for certain species such as snoek, a staple of the traditional linefish fishery. The vessel is required to carry two independent scientific fishery observers at all times; one to sample the catch in the factory whilst the other monitors any large bycatch on the deck. Observers are now required to report in real-time their estimations of bycatch to the skipper and as previously, they submit a catch report to DEFF daily. The bycatch move-on rule thresholds and responses apply to both the West and East Coast of South Africa and have been lauded by some as a step in the right direction towards a sustainable fishery.

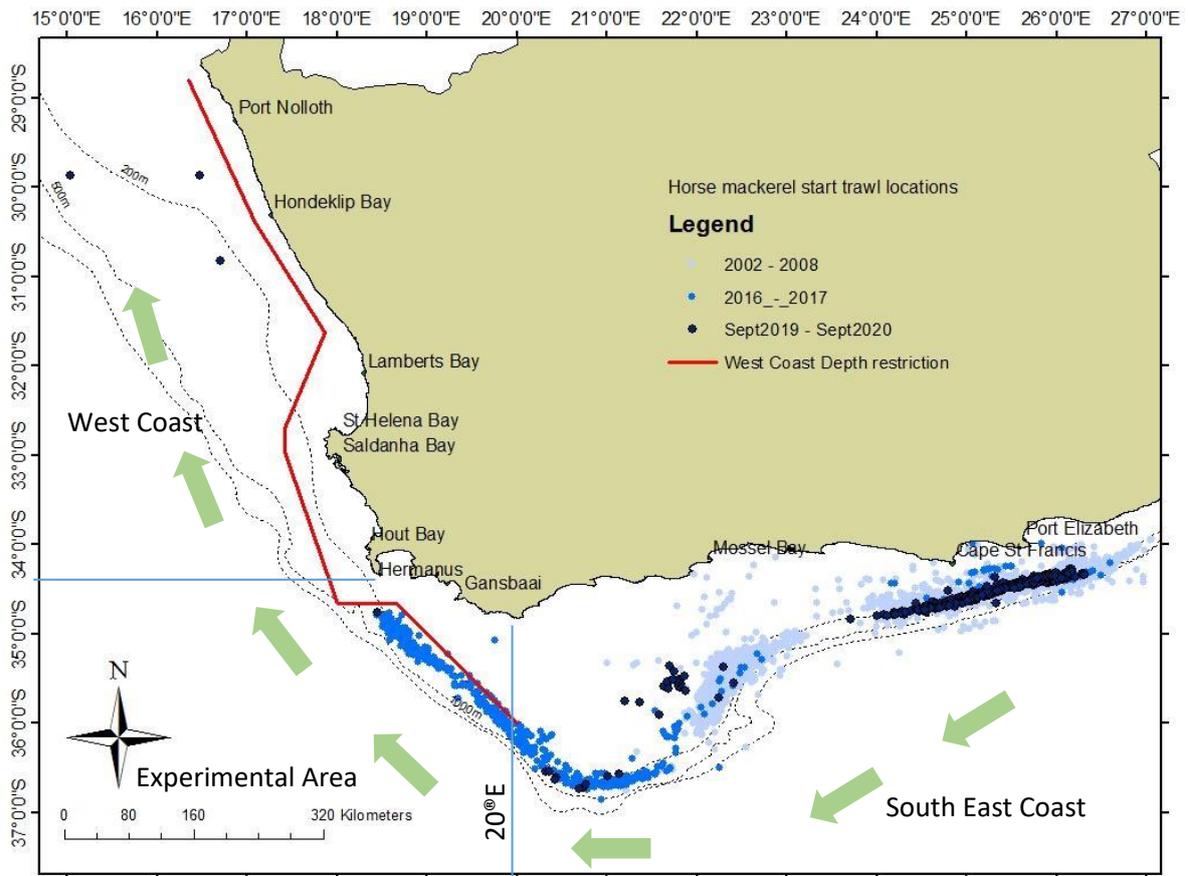


Figure 2 Location of commercial trawls recoded by observers, separated by years. Red line indicates the depth restriction on the West Coast.

In Namibia horse mackerel are caught by 15 midwater directed trawlers ranging in lengths from 62 – 120 m, which are restricted to operate in waters deeper than 200m and also monitored by observers (100% observer coverage). In both countries demersal trawl fisheries are allocated a horse mackerel allowable bycatch limit, which is a fraction of volume of the targeted fishery. Horse mackerel fishing activities in Namibia are distributed from 17°15'S in the north to about 27°00'S but the bulk of the catches come from the area north of 24°00'S (Figure 3). However, the 2019 distribution shows a higher concentration of catches around 25°00'S compared to the other years. Further, the 2017 distribution was longitudinally wider than that of the last 2 years, particularly when compared to the 2018 distribution. In all likelihood this variation is linked to catchability - fish moving out of the usual fishing grounds causing the fishery to search further south. It should be further noted that the horse mackerel resource is highly variable and catchability and abundance is subject to environmental fluctuations.

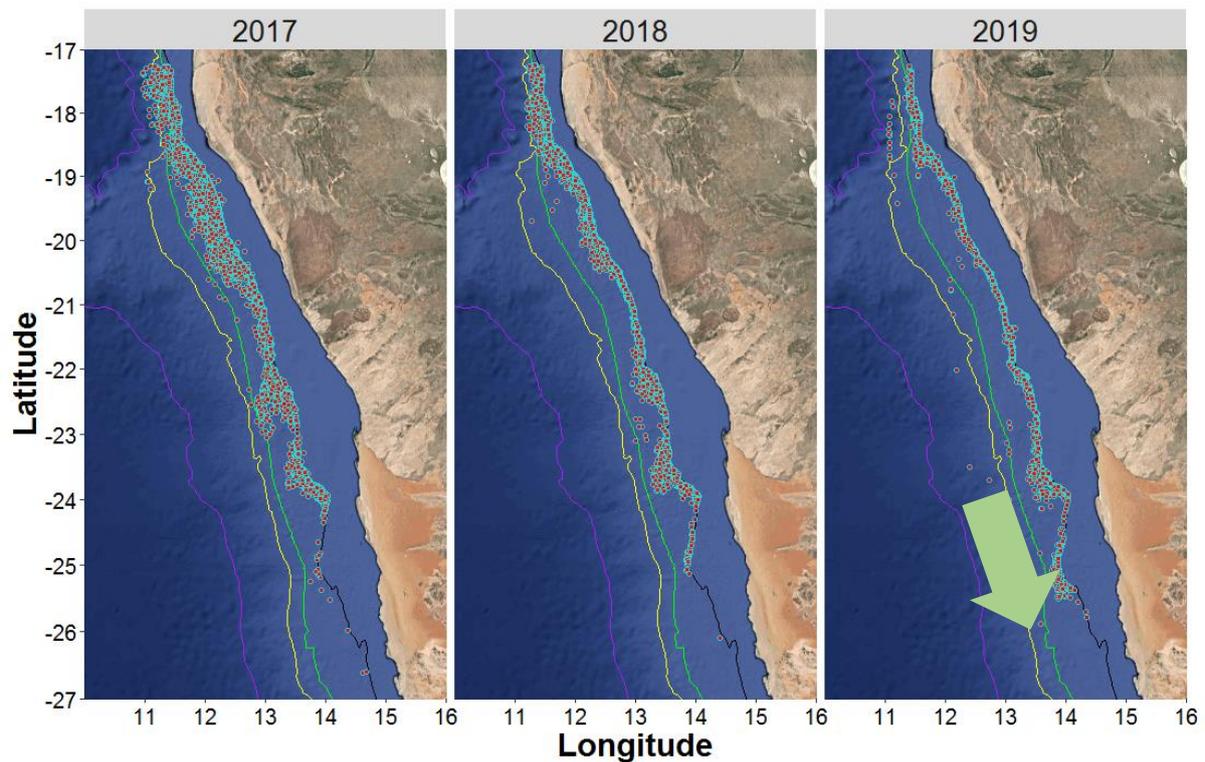


Figure 3. Distribution of midwater trawl catches in 2017 – 2019 in Namibia. Green arrow indicates the movement of fishing activity further south. Source: Namibian 2019 State of Stocks report

Status of the stock(s)

Cape horse mackerel (in both countries) are managed through a Total Allowable Catch (TAC). The TAC is determined based on survey (biomass) and commercial (catch-per-unit-effort) data, which is calculated using an Age-Structured Production Model (ASPM). The 2020 TAC in Namibia (approx. 330 000 tonnes) is significantly larger than in South Africa (36 125 tonnes) and along with hake, is one of the most important fisheries for Namibia, contributing significantly to the economy. According to the Namibian 2019 State of Stocks report submitted to the Ministry of Fisheries and Marine Resources (MFMR) the horse mackerel biomass was approximately 1.42 million tonnes in 2019 (an 11% decrease from the last assessment, Figure 4). Put in perspective the biomass estimate for South Africa was approximately 250 000 tonnes in 2019 (Figure 5). Both the Namibian and South African Cape horse mackerel are considered to be above Maximum Sustainable Yield (MSY) – a trend that is likely to sustain for the next few years.

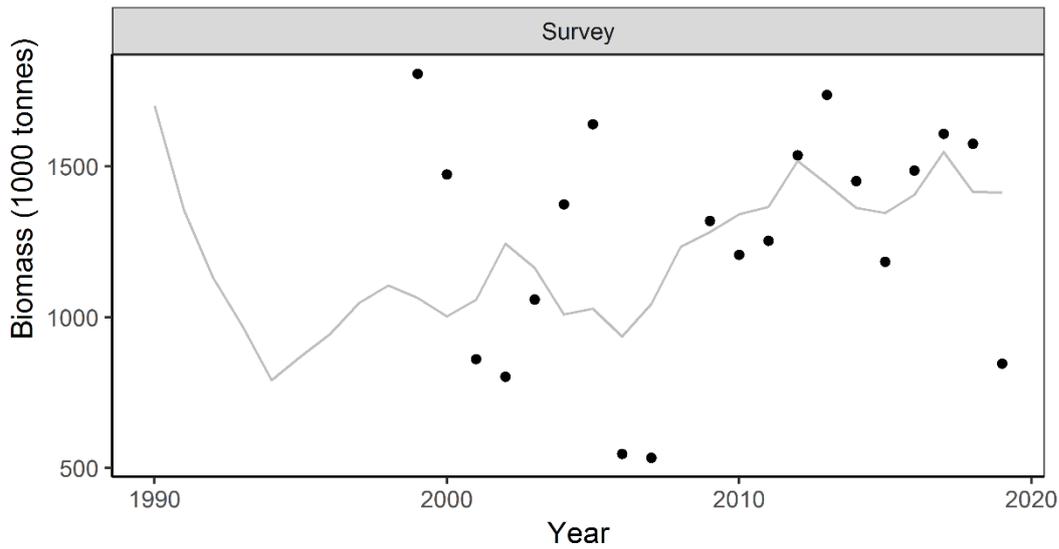


Figure 4. Total biomass estimated from acoustic surveys between 1961 – 2020 for the Namibian Cape Horse mackerel. Source: Namibian 2019 State of Stocks report.

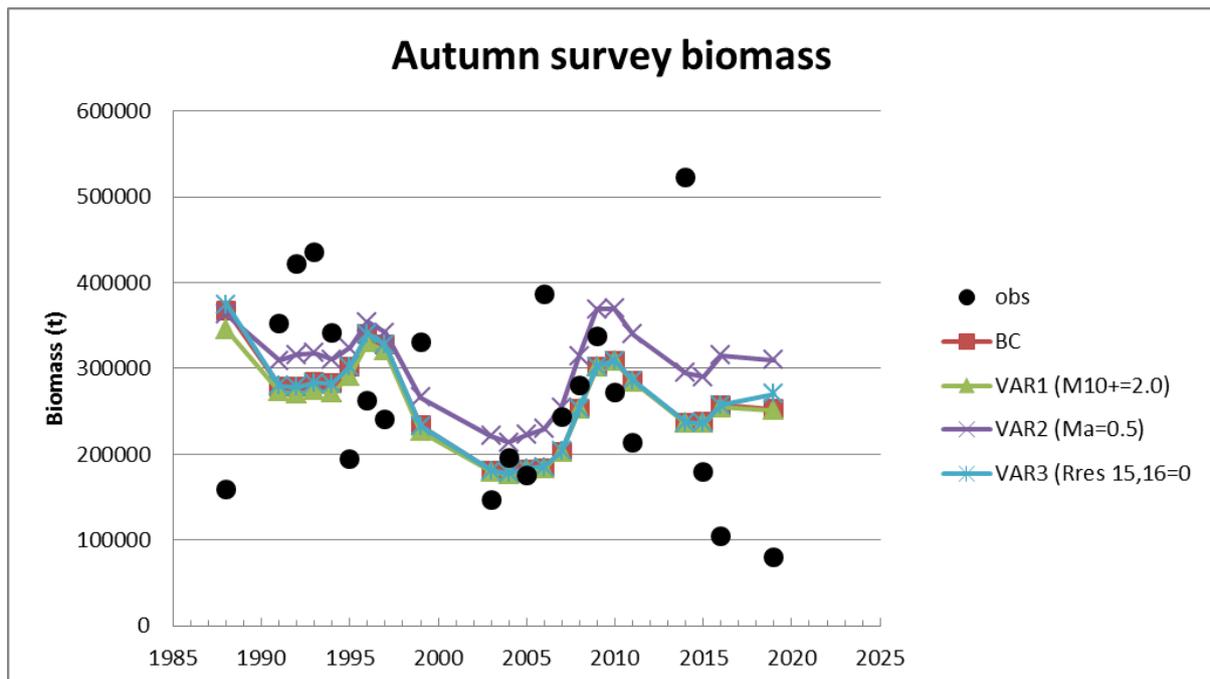


Figure 5. Autumn swept-area survey biomass estimate for South Africa. Black dots represent direct survey observations. BC = base case. VAR 1 – 3 = variations of the model Source: S.J. Johnston and D.S. Butterworth 2020

In Namibia catch rates were generally low during the period 1990 to 2008 with minor year to year fluctuations when compared to the period after 2009. From 2009 catch rates were high, peaking in 2010, from where it decreased and stabilised to around 14 tonnes/hour from 2013 to 2019 (Figure 6).

Catch rates in South Africa were also high after 2009, peaking in 2011 before dropping significantly in 2015. Thereafter the catches seemed to have recovered, peaking again in 2018 before dropping again in 2019 (Figure 8). Scientists (Johnston & Butterworth 2020) hypothesised that the rapid decline in catches in 2015 were due to either an overall decrease in abundance on the Agulhas Bank (associated with poor catch rates), overfishing of the adult stock and/or a change to the marine environment on the Agulhas Bank that might have led to an anomalous spike in the natural mortality of horse mackerel in 2014. After the recent assessment (Johnston & Butterworth 2020) it would appear that there is now little support for the hypothesis of an extra natural mortality event having been responsible for the drop in CPUE in 2015.

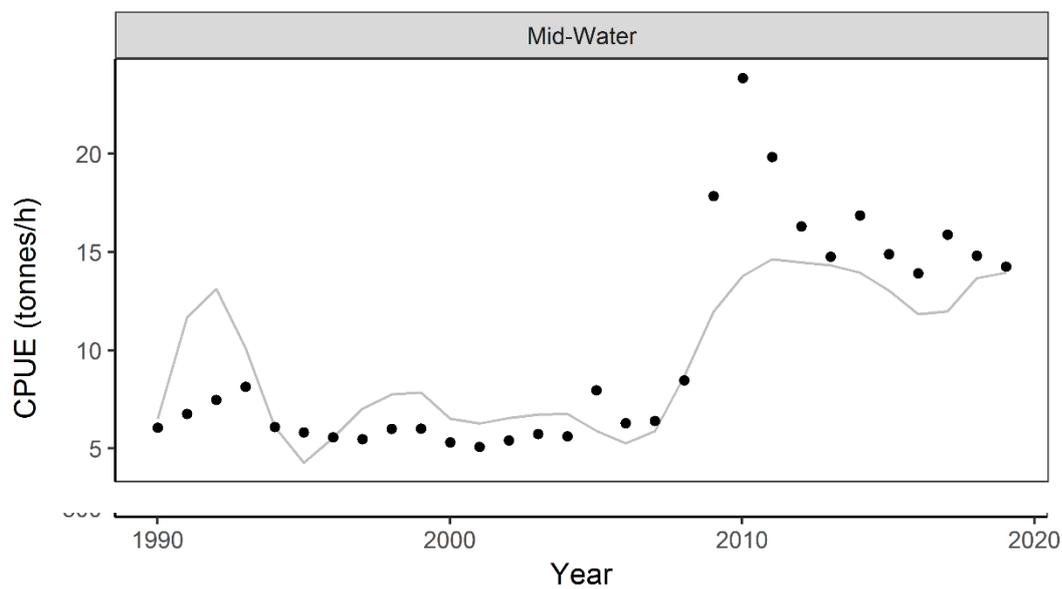


Figure 6. Catch rates from the midwater trawlers in Namibia (1990 - 2020). Source: Namibian 2019 State of Stocks report

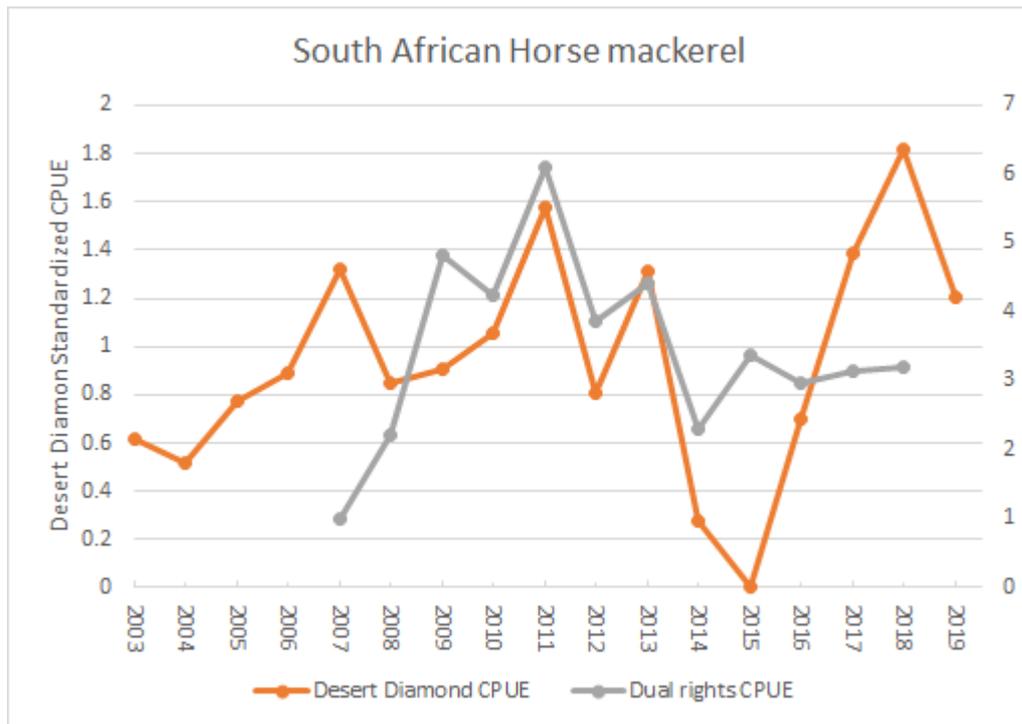


Figure 7. Catch rates for the FV Desert Diamond and dual rights vessels in South Africa, 2003-2019. Source: S.J. Johnston and D.S. Butterworth 2020.

References

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