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STATUS AND MANAGEMENT OF THE SOUTH AFRICAN SMALL PELAGIC FISHERY– 2018

South African Small Pelagic Fisheries

A new Operational Management Procedure (OMP) that replaces the old OMP-14 is now in process of implementation for the Small Pelagic fishery (referred to as OMP-18). The decision to apply the new OMP was taken by the Small Pelagic Scientific Working Group (SPSWG) which comprises of a dedicated and highly experienced group of biologists, stock assessment scientists, NGOs and industry representatives. This new OMP, that determines the sardine and anchovy catch limits, is dependent upon sardine biomass estimates obtained from the annual October/November hydro-acoustic survey. It includes a new Harvest Control Rule (HCR) for calculating the directed >14cm sardine Total Allowable Catch (TAC) and associated ≤14cm sardine Total Allowable Bycatch (TAB). The OMP formulae are developed to ensure low probabilities that the abundances of sardine and anchovy might drop below agreed threshold levels under which successful future recruitment might be compromised. This OMP is therefore designed to respond to the state of the small pelagic stocks (anchovy and sardine primarily) in a calculated and precautionary way.

The recommended TAC and TABs are issued at the start of the fishing season in January each year. These are shown in Table 1. The end of year hydro acoustic biomass survey (November 2017) provided a critical basis for the TAC and TAB determination for 2018 (see the table below). The determined biomass for sardine (334.8 x 1000 t) was comparable with 2016 (Figure 1) with no significant improvement. The May 2017 sardine recruitment estimate was some 7.16 billion fish, also showing only a small improvement compared to the 2016 estimates. The follow-up recruitment surveys in 2018 could not be done and as a consequence, the basis for revised TAC allocations was mathematically derived. This included applying the lowest 5% percentile recorded recruitment estimates for anchovy in the last decade.

Table 1. Table showing the allocation of allowable catches issued by the Department of Agriculture Forestry and Fisheries for 2018 with mid-year revisions compared to 2017 catches. (de Goede pers comm.)

Species and Category Allocated	2018 Recommended TAC's	2018 revised TAC's	2017 Catch
Initial directed >14cm sardine TAC:	59 214 t	65 000 t	31 379 t
Initial ≤14cm sardine TAB for directed >14cm sardine fishing:	4 145 t	4 550 t	173 t
Initial directed anchovy TAC:	247 500 t	315 242 t	216 795 t
Initial ≤14cm sardine TAB with directed anchovy fishing:	25 129 t	25 129 t	4 484 t
>14cm sardine TAB with directed redeye round herring and anchovy fishing:	7 000 t	7 000 t	1 725 t
≤14cm sardine TAB with directed redeye round herring fishing:	1 000 t	1 000 t	262 t
Anchovy TAB for sardine only right holders:	500 t	500 t	12 t
Redeye round herring PUCL	100 000 t	100 000 t	55 144 t
Horse mackerel TAB	8 947 t	8 947 t	1 466 t
Mesopelagic PUCL (Lantern and Lightfish)	50 000 t	50 000 t	325 t

For sardine however, the lack of a recruitment survey was not relevant, as Interim OMP-18 was used to inform the sardine TAC. Under this OMP the sardine TAC in 2018 is entirely dependent on the spawner biomass recorded in 2017 and this resulted in there being a slight increase in the TAC to 65 000 t.

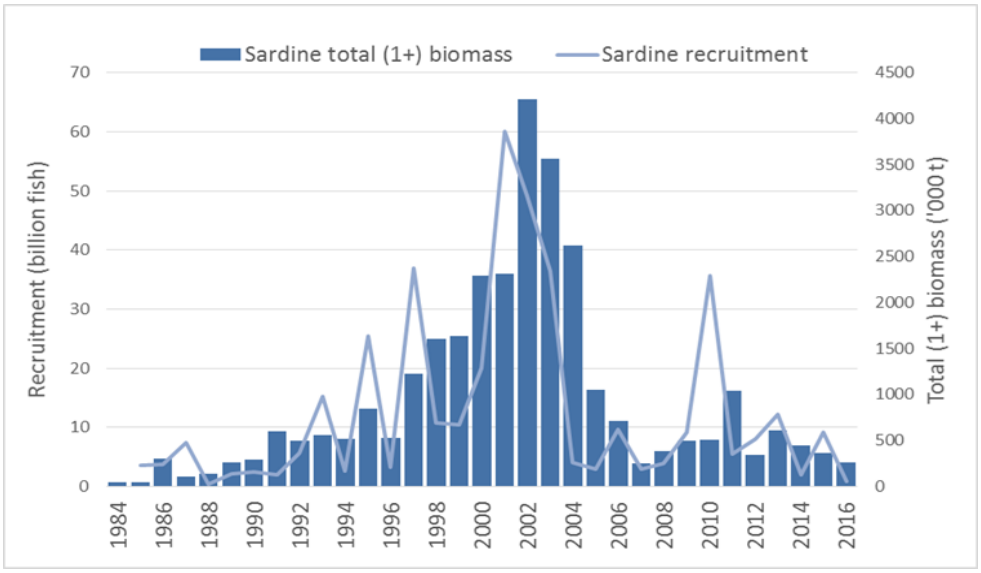

Figure 1: Time-series of acoustic survey estimates of total sardine biomass in October/November (bars) and recruitment in May/June (lines) since the start of the acoustic survey program. Note. 2017 update November 2017 biomass = 334.8 x 1000 t and May 2017 recruitment 7.16 billion fish (Coetzee pers comm.).

We have previously discussed the different sardine "stock hypotheses" around which there still remains some uncertainty. Spatial management of the fishery, sardine in particular, is critical for the long-term sustainability of the resource. As reported by Coetzee et. al (2017), the "*current understanding is that the South African sardine stock comprises a single "stock" (in the sense of a reproductively isolated biological unit), but there is spatial structure within this stock, which has been hypothesized to comprise multiple components, with a western (distributed off the West Coast; i.e. to the west of Cape Agulhas), southern (distributed off the South Coast from Cape Agulhas to Port Alfred) and eastern (distributed off the South Coast in spring/summer and the East Coast in autumn/winter when they undertake the annual sardine run) components (or sub-stocks) suggested.*" The historical catches, shown as the Harvest Proportion relative to the Biomass in the areas east and west of Cape Agulhas (20^0 E) is shown in the figure below (Figure 2).

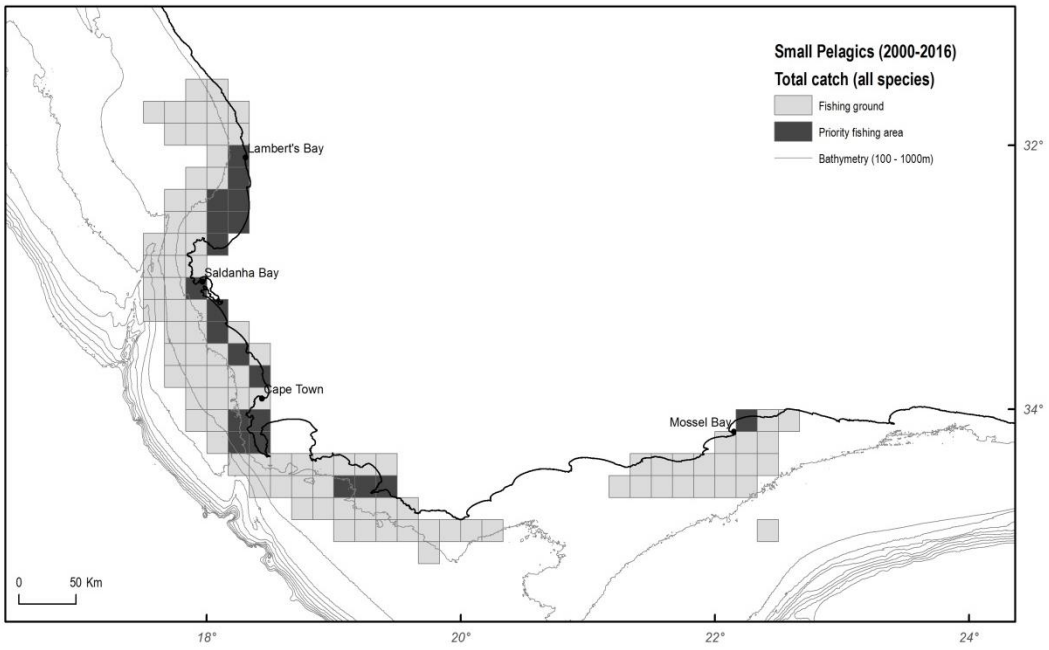

Figure 2. Harvest proportion for the area to the west of Cape Agulhas, east of Cape Agulhas and for the entire coast. Note: the biomass proportions are based on the actual catch in any one year assuming the biomass estimated from the November surveys in the year preceding the year the catch was made. (after Coetzee *et. al*. 2017)

The management advice assumes that the fishery operations will continue to "*mimic their recent past behaviour whereby the proportion of sardine catches taken in the area to the west of Cape Agulhas is between 60 and 75%*". The scientists have cautioned the industry that if catches taken to the west of Cape Agulhas are not restricted to below this range it could jeopardise the recovery of the sardine population. The small pelagic industry have been proactive in addressing this concern. Participation in the study on Fisheries Management Areas (FMAs) was supported by the Responsible Fishery Alliance (RFA). This study identified the historical critical areas fished as well as the main bycatch components of both the sardine and anchovy-directed fisheries (Figure 3).

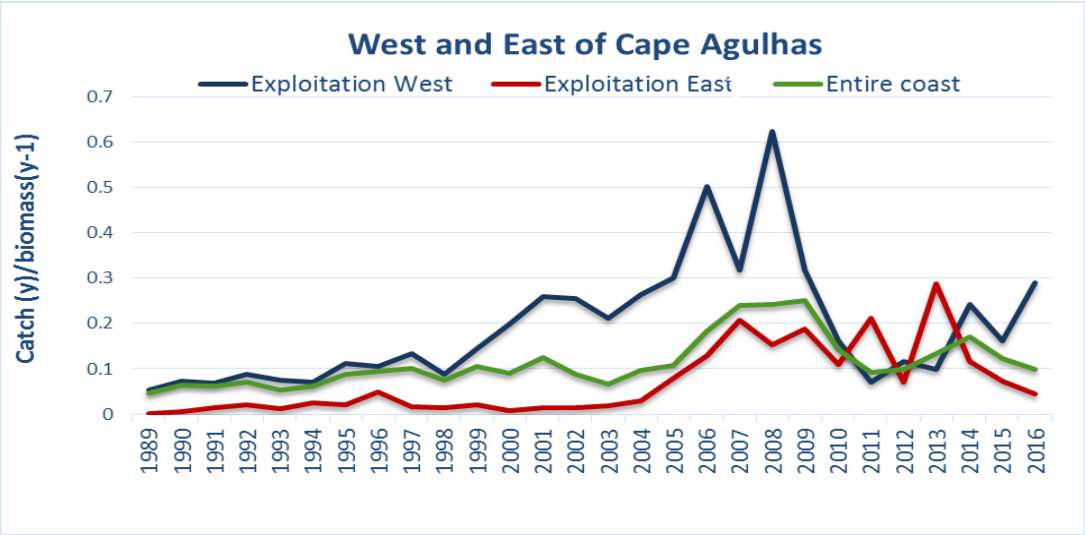

Figure 3. Cumulative small pelagic catches between 2000 to 2016 shown the priority fishing areas identified using the 90% percentile i.e. statistically the primary fishing areas (Norman et. al. 2018).

The South African Small Pelagic Fishing Industry Association (SAPFIA) has also implemented a dedicated observer programme working collaboratively with CapMarine and DAFF, the aim of which is to monitor directed catches of anchovy and sardine, as well as other bycatch species. This programme provides valuable information on not only operational patterns, but also on catch size distributions, bycatch and other biological data that is used by DAFF scientists in the day to day management of the fishery (see Figure 4 showing some of the information from the observer programme as reported by CapMarine for August 2018).

In conclusion, while there may be some concerns around the status of the small pelagic fish stocks, it remains under firm management, with researchers, managers and industry working closely and proactively to ensure the ongoing sustainability of the fishery.

J.C. Coetzee, C.L. de Moor and D.S. Butterworth. 2017. A summary of the South African sardine (and anchovy) fishery. MARAM/IWS/2017/Sardine/BG1.

S.J. Norman, S.J. Wilkinson, D.W. Japp, J. Reed and K.J Sink. 2018. A Review and Strengthening of the Spatial Management of South Africa's Offshore Fisheries (unpub. Report).

S. Wilkinson . 2018. SAPFIA Scientific observer programme progress report, August 2018.

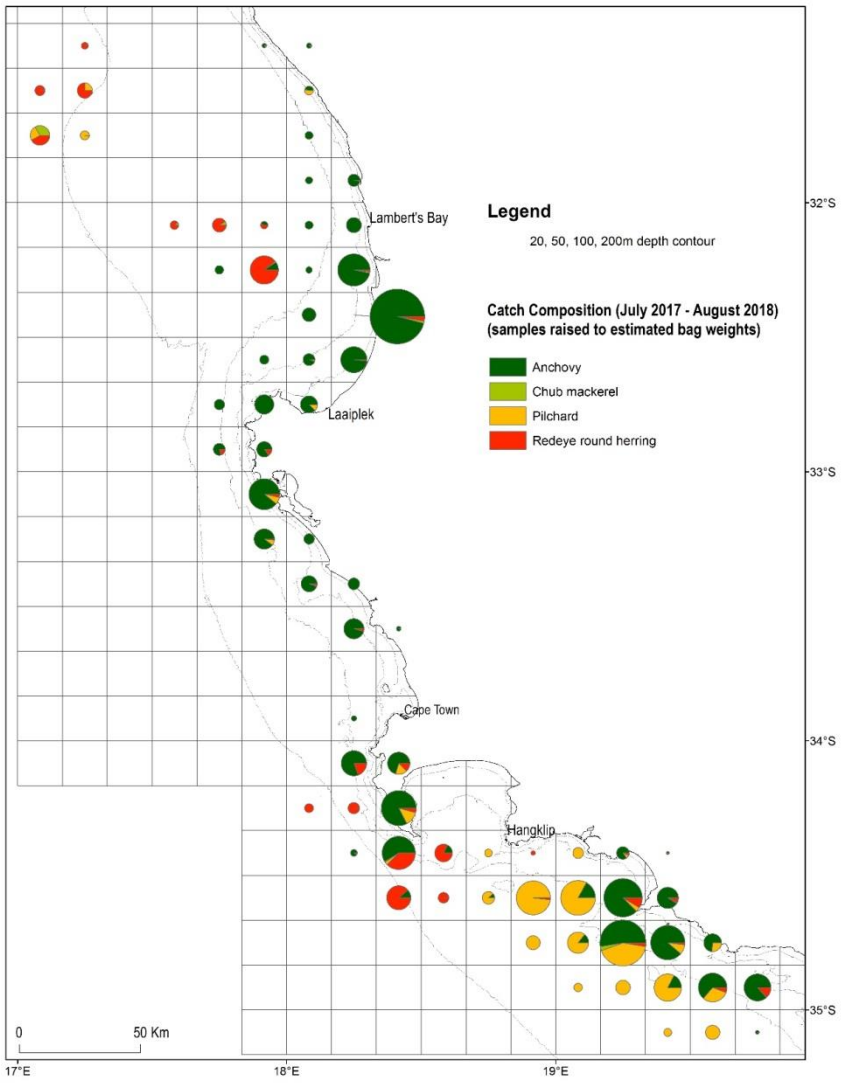

Figure 4. Spatial distribution (summarised by grid block) of species composition of observer samples raised to the estimated bag weight (01 July 2017 to 31 August 2018.)(after Wilkinson, 2018).