

ARK responses to statements made by Sea Shepherd

Sea Shepherd statement

There's no bigger threat to the Antarctic ecosystem than fishing.

ARK response

There is no evidence that fishing presents a significant threat to the Antarctic ecosystem. Krill harvesting has been managed in a very precautionary manner in recognition of the critical role of krill in the Antarctic ecosystem, a keystone species, and uncertainties associated with environmental changes, including climate change. CCAMLR's approach to managing the krill fishery is to minimise the impact on the ecosystem rather than trying to maximise the size of the fishery. The krill fishery is confined to areas of the Convention Area where risks to the Antarctic ecosystem are considered to be low.

The fishery is operating within the regulation developed from "the agreed, best available science" that has been accepted as being highly precautionary by the CCAMLR governance system. CCAMLR does not find that there are impacts of fishery on the ecosystem, either at large nor at fine scales.

Sea Shepherd statement

Precautionary catch limits were set in the 1990s but these are outdated and do not take into account climate change and technological advances of fishing vessels.

ARK response

The current allocation of the precautionary catch limit for krill was adopted in 2009 and is contained in [Conservation Measure 51-01](#) and [Conservation Measure 51-07](#) which was last revised in 2022. The total allowable catch (TAC) limit is reviewed annually by CCAMLR's Working Group on Ecosystem Monitoring and Management (WG-EMM) and the Scientific Committee.

The TAC is determined through a stock assessment which models krill population's birth, growth and death rates, and different levels of fishing pressure. The process involves thousands of simulations to determine a sustainable catch limit.

The precautionary limit was further subdivided in 2009 across subareas 48.1, 48.2 and 48.4 to avoid inadvertent ecosystem impacts due to fishing.

The catch limit for Antarctic krill in Antarctica has **never** been reached since the adoption of the conservation measure for the krill fishery in the 1990's. Catches vary from season to season. Since the adoption of CM 51-07 in 2009, which further subdivides catches per subarea, the catch limits in subareas 48.2 and 48.3 have never been reached.

The set catch limit means that technological advances of fishing vessels is not a relevant factor. They may, however, result in more efficient ways of fishing, for example by the development of fishing gear that reduces incidental mortality of other species.

Sea Shepherd statement

... many scientists consider these quotas to be outdated. The last survey was in 2006.

ARK response

A [large-scale krill survey](#) was conducted in 2019-20 and published in an international peer review journal¹. The paper includes participation of scientists from Norway, the UK, the USA, Australia, Republic of Korea and China, most of them actively participating in CCAMLR's Scientific Committee.

The results clearly indicate that the krill population has remained at the same level as the previous large-scale survey conducted in 2000.

The total allowable catch for the southwest Atlantic is currently about 5.6 million tonnes annually. However, CCAMLR has decided that the catch will be regulated within a 620 000 tonne 'trigger' level, subdivided across four regions in the southwest Atlantic. This 'trigger' level represents approximately 1% of the estimated 60+ million tonnes of the current biomass of the krill population in this region. The actual trigger level has not ever been reached. CCAMLR has agreed that any expansion in the krill fishery should not happen unless scientific data indicate that it will continue to be sustainable.

Sea Shepherd statement

Krill populations have actually declined by 80% since the 1970s

ARK response

The scientific literature presents contrasting evidence regarding krill population trajectories². Nonetheless, many scientists agree that krill declined from ~1920s to 1980s (before the expansion of the krill fishery), but it remained stable, although with great inter-annual fluctuations, since 1990s to the present.

Sea Shepherd statement

The demand for krill has more than doubled.

ARK response

The claim that the demand for krill has more than doubled is based on a [2021 study](#) which proposed that the global demand for **fish** is expected to double by 2050.

Nevertheless, the UN Food and Agriculture Organization (FAO) estimates we will need a 70 % increase in production of food and nutrients by 2050. The pressure on land-based resources is already critical in terms of climate emissions, freshwater use, biodiversity loss, deforestation and pollution from pesticides.

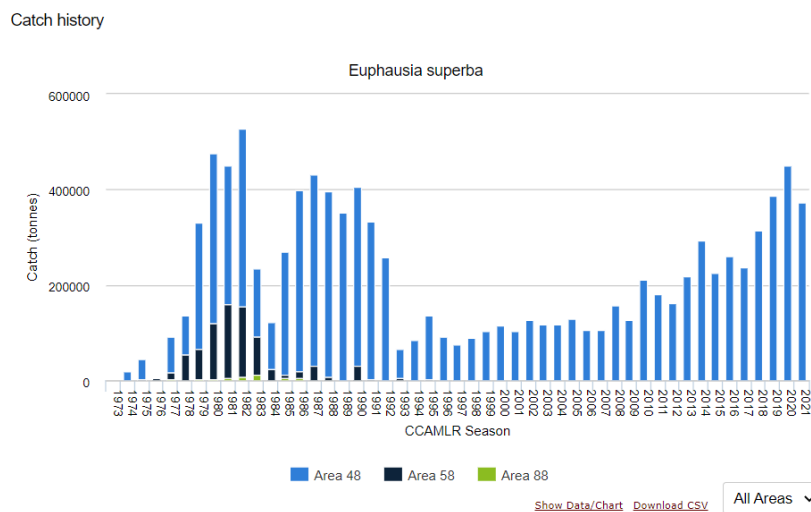
¹ B. A. Krafft, G. J. Macaulay, G. Skaret, T. Knutsen, O. A. Bergstad, A. Lowther, G. Huse, S. Fielding, P. N. Trathan, E. J. Murphy, S.-G. Choi, S. Chung, I. Han, K. Lee, X. Y. Zhao, X. Wang, Y. Ying, X. Yu, K. Demianenko, V. Podhornyi, K. Vishnyakova, L. Pshenichnov, A. Chuklin, H. Shyshman, M. J. Cox, K. Reid, G. M. Watters, C. S. Reiss, J. T. Hinke, J. A. Arata, O. R. Godø, and N. Hoem. 2021. Standing stock of Antarctic krill (*Euphausia superba* Dana, 1850) (Euphausiacea) in the Southwest Atlantic sector of the Southern Ocean, 2018–19. *Journal of Crustacean Biology* 41 (3):1-17. <https://doi.org/10.1093/jcabi/ruab046>

² S. G. Candy. 2012. Long-term Trend in Mean Density of Antarctic Krill (*Euphausia superba*) Uncertain. *Annual Research & Review in Biology* 36 (12):27-43. DOI: 10.9734/ARRB/2021/v36i1230460
M. J. Cox, S. G. Candy, W. K. De la Mare, S. Nicol, S. Kawaguchi, and N. Gales. 2018. No evidence for a decline in the density of Antarctic krill *Euphausia superba* Dana, 1850, in the Southwest Atlantic sector between 1976 and 2016. *Journal of Crustacean Biology* 38 (6):656-661. <https://doi.org/10.1093/jcabi/ruy072>

It is clear that we need to harvest more from the ocean and in a manner that protects ocean health and marine biodiversity globally. Antarctic krill is part of the solution for our future food systems, as one of the world's biggest and most underutilized marine resources and a krill fishery that is tightly regulated by [CCAMLR](#) and one of the best managed fisheries in the world.

As pointed out earlier, CCAMLR's approach to managing the krill fishery is to minimise the impact on the ecosystem rather than trying to maximise the size of the fishery. AS CCAMLR works by consensus, it would require all 26 Members to agree to an increase in catches.

Finally, it should also be noted that krill catches have never reached the 'trigger level', and that the largest catches ever recorded occurred during the 1970s and 80s.



Source: CCAMLR

Sea Shepherd statement

The presence of industrial trawlers pollutes this once-pristine environment through emissions, oil spills, the loss or dumping of deadly fishing gear, introduction of invasive species through biofouling, and the humanitarian and environmental effects of Illegal, Unreported and Unregulated (IUU) fishing.

ARK response

CCAMLR [Conservation Measure 26-01](#) prohibits all fishing vessels in the Convention Area from dumping or discharging oil, fuel products or oily mixtures and plastic into the sea.

This includes fishing gear. Whilst gear may occasionally be accidentally lost, all such losses are required to be retrieved if possible and reported.

There have been very few reports of Illegal, Unreported and Unregulated (IUU) since 2010 and IUU harvesting of krill has never been reported.

Sea Shepherd statement

The voluntary industry agreement where some - -but not all – of the krill fishing trawlers have promised to avoid trawling in certain – but not all – sensitive areas in certain seasons, has already been called into question because they are neither monitored nor enforced.

ARK response

All krill vessels are tracked in real-time via Vessel Monitoring System (VMS) which is monitored by the CCAMLR Secretariat. No incursions into Voluntary Restricted Zones (VRZs) have been reported. The compliance with the VRZ is reviewed annually by an independent group of experts and their report published on ARK's website (<https://www.ark-krill.org/>).

Sea Shepherd statement

CCAMLR's Scientific Committee has recommended that observers be placed on 100% of Antarctic krill fishing vessels...

ARK response

Observers have been working on krill vessels since the 1990s. Since 2020, CCAMLR has required 100% scientific observer coverage of all fishing vessels operating within the Convention Area. Many krill vessels currently carry two international scientific observers.

Sea Shepherd statement

..there's heavy greenwashing in the krill supplement market. NGOs and scientists have raised the flag about certification schemes like the Marine Stewardship Council (MSC) and Friend of the Sea (FOS), which were found to be certifying numerous fisheries as sustainable even when they were overfished, had high levels of bycatch and, in some cases were even at odds with national legislation.

ARK comment

It is regrettable that Sea Shepherd chooses to undermine the valuable work of the MSC and FOS, both of which are reputable and highly regarded organisations, on the basis of misleading information contained in the Netflix show *Seaspiracy*.

Sea Shepherd statement

In 2016 Antarctica's second largest colony of emperor penguins collapsed and more than 10 000 chicks died.

ARK response

Emperor penguins breed on ice shelves around the Antarctic continent. Global warming has reduced the stability of these ice shelves, causing the loss of several colonies in recent years.

There is no krill fishing in the proximity of any Emperor penguin colony. Emperor penguins feed primarily on fish, followed by squid. Krill is not a staple food source for this species.

The event indicted in Sea Shepherd's statement was the result of a severe storm. It was reported that there was no obvious climate signal to point to as atmospheric and ocean observations in the vicinity revealed little in the way of change.

Captain Peter Hammarstedt statement

"We are seeing sharp declines in humpback whale pregnancies, a decrease in the body mass of fur seals and a plummeting of chinstrap penguin populations. All three species depend on krill as a primary food source. All while climate change has reduced both the amount and duration of the sea ice that krill need to survive."

ARK response

Antarctic fur seals had recovered and surpassed pre-hunting population size and are now at their maximum carrying capacity [Forcada and Staniland 2009, Hoffman et al. 2022], which implies stronger effect of inter-annual variability in food supply due to intra-specific competition, and, as indicated below, competition from whales [see also Convey and Hughes 2022].

Chinstrap penguin colonies are decreasing across its distribution, including several locations not exposed to krill fishing activity – see maps on Strycker et al. 2020.

A [recent survey](#) of fin whales found evidence of high densities, re-establishment of historical behaviours and the return to ancestral feeding grounds, indicating a recovering population

Finally, the alluded decline in humpback whale pregnancy rate seems derived from a recent publication by Pallin et al. (2023) and is misleading. These authors indicated that "Today, most populations of humpback whales in the Southern Hemisphere have recovered and are at or near their carrying capacity." This same study indicates that pregnancy level in this population is high and the observe inter-annual variability obeys to natural fluctuations in krill abundance. The authors conclude that the "krill surplus" era had concluded (which aligns wit result from Antarctic fur seals from South Georgia. (Hoffman et al. 2022)³.

Fishing interaction with whales

Whales and fishing vessels both seek Antarctic krill, so the co-occurrence of both at the same locations is not surprising. However, actual interaction between both is rare.

Krill fishing vessels trawl at very low speed - 1.5 - 3 knots. By contrast, fin whales swim at a cruise speed of 6 knots, but are capable of reaching up to 22 knots in short bursts. Thus, avoiding a passing vessel is easy for a whale.

The unfortunate catch of four humpbacks in recent seasons prompted a swift reaction by industry, which developed and implemented a whale exclusion device – a strong, tight net placed on the mouth of each trawl to avoid further entanglement. This was agreed by CCAMLR's Working Group on Incidental Mortality Associated with Fishing (WG-IMAF) to be best practice and has proved to work very well since implementation.

³ P. Convey and K. A. Hughes. 2022. Untangling unexpected terrestrial conservation challenges arising from the historical human exploitation of marine mammals in the Atlantic sector of the Southern Ocean. *Ambio*:<https://doi.org/10.1007/s13280-022-01782-4>
Forcada, J., and I.J. Staniland. 2009. Antarctic fur seal *Arctocephalus gazella*. In *Encyclopedia of marine mammals*, 2nd ed., ed. W.F. Perrin, B. Würsig, and J.G.M. Thewissen, 36–42. London: Academic Press.
J. I. Hoffman, R. S. Chen, D. L. J. Vendrami, A. J. Pajjmans, K. K. Dasmahapatra, and J. Forcada. 2022. Demographic Reconstruction of Antarctic Fur Seals Supports the Krill Surplus Hypothesis. *Genes* 13:541-<https://doi.org/10.3390/genes13030541>
N. Strycker, M. Wethington, A. Borowicz, S. Forrest, C. Witharana, T. Hart, and H. J. Lynch. 2020. A global population assessment of the Chinstrap penguin (*Pygoscelis antarctica*). *Scientific Reports* 10:19474-<https://doi.org/10.1038/s41598-020-76479-3>
L. J. Pallin, N. M. Kellar, D. Steel, N. Botero-Acosta, C. S. Baker, J. A. Conroy, D. P. Costa, C. M. Johnson, D. W. Johnston, R. C. Nichols, D. P. Nowacek, A. J. Read, O. Savenko, O. M. Schofield, S. E. Stammerjohn, D. K. Steinberg, and A. S. Friedlaender. 2023. A surplus no more? Variation in krill availability impacts reproductive rates of Antarctic baleen whales. *Global Change Biology*:DOI: 10.1111/gcb.16559