



Killing the Antarctic Krill: Assessing State–Corporate Environmental Crime in the Southern Ocean

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Abstract

Antarctic krill is a keystone species in the Southern Ocean ecosystem, in that it plays an essential role in healthy marine food webs and carbon sequestration. However, its survival is increasingly being threatened by a growing industrial fishery dominated by powerful corporations alongside habitat changes caused by climate change. This article examines how states enable and/or fail to prevent the large-scale depletion of Antarctic krill by corporate actors, questioning whether this constitutes state–corporate environmental crime. This illustrates potential governance failures to manage stocks sustainably within the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). Drawing on state–corporate crime theory, green criminology and comparative cases of transnational extractive harm, the article analyses governance failures within the CCAMLR as a site of regulatory capture and institutional inertia. The analysis reveals patterns of state–corporate collusion and regulatory inaction, with states such as Norway and China promoting krill exploitation for economic benefit by blocking stricter quotas and the establishment of marine protected areas. These omissions and actions by states in partnership with industry amount to state-enabled ecological harm, effectively entrenching transnational environmental harms. The article concludes that stronger international oversight, reformed governance procedures and genuine accountability for the state and corporate actors driving ecological degradation in Antarctica are urgently required, and that CCAMLR member states must prioritise scientific guidance over commercial interests in the management of this ecologically critical species.

Keywords: Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR); environmental harm; green criminology; state–corporate crime.

Introduction

The remote Southern Ocean surrounding Antarctica has become the site of intensifying industrial harvest for Antarctic krill (*Euphausia superba*). In 2025, the market for Antarctic krill was valued at over US\$1.4 billion; by 2036 it is expected to grow to US\$3.6 billion (Taylor et al., 2025). In 1991, the Commission for the Conservation of Marine Living Resources (CCAMLR) set a precautionary seasonal limit for krill fishing; based on best available scientific evidence, this limit was 620,000 tonnes (Taylor et al., 2025). Until 2025, that limit had never been reached. However, the first seven months of the 2024–2025 season brought in 624,917 metric tonnes of krill. This exceeded the catch limit and was the largest catch ever recorded in a season



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(Goodman, 2025; Tomassoni, 2025). The krill fishing surge has been driven by 12 vessels across 10 companies from China, Norway, South Korea, Chile and Ukraine (Meyer et al., 2025). Antarctic krill is the species of krill found in 95 per cent of products using krill worldwide (Taylor et al., 2025) and is extracted for use in non-essential items such as pet food, omega-3 oil supplements and fish meal for aquaculture. The ecological impacts of industrial krill fishing in the Southern Ocean have included reduced availability of food for krill-dependent predators (Savoca et al., 2024), disrupted breeding rates among penguins (Youngflesh et al., 2021) and fatal entanglement of humpback whales in krill fishing gear (Gibson, 2024). Responding to this, environmental advocacy groups have called for better regulations around Antarctic krill fishing (ASOC, 2025; Godø & Trathan, 2022).

Antarctic krill fisheries operations are managed by CCAMLR and its member countries. CCAMLR (1982) is a multilateral convention that manages species deemed marine resources in the region south of 60 degrees (Rosemarin et al., 2023). The members of CCAMLR oversee catch quotas and license fishing vessels; they have agreed to do so based on the best available scientific evidence (CCAMLR, 1982). As of 2025, CCAMLR has a membership of 28 consultative members (including the European Union) and three non-consultative members (ATS, 2025). The multilateral institution is based on consensus-style governance, meaning all voting members must agree for a measure to pass. Meetings are held annually in Hobart, Tasmania, and include observers from non-government organisations and the fisheries industry alongside members (Rosemarin et al., 2023). Members put forward Conservation Measures – rules that, once passed, establish binding parameters for krill fishing. These meetings are attended by member states and designated observer groups, including a scientific committee, and both environmental and fisheries organisations (COLTO & ASOC, 2022). The opportunity for vessels to seasonally overfish is facilitated by CCAMLR's quotas, which covers a vast area without sufficient local fine-tuning (Taylor et al., 2025). As a result, krill catch has become increasingly concentrated in smaller ecologically sensitive zones alongside the overall uptick in catch (Taylor et al., 2025). Current krill fisheries practices therefore risk the ecological wellbeing of already vulnerable Southern Ocean ecosystems (Taylor et al., 2025; Trathan et al., 2025).

This article integrates ecological considerations with a criminological focus on state–corporate collusion. It draws on a critical green criminological approach to elucidate: (1) how and why the extensive extraction of krill has proceeded; (2) the ecological impacts of the fishery that has been established; and (3) whether this should be considered a form of state–corporate environmental crime. To address these aims, the article draws on data from scientific evidence on several key points: estimated krill biomass and trends; predator consumption rates; krill fishery catch levels; and carbon export by krill (FoodTank, 2024; Taylor et al., 2025). CCAMLR's regulatory documents were closely reviewed, including Conservation Measure 51-01, which sets the overall krill catch limit and its subarea limits. Catch statistics from media were verified against CCAMLR's official catch database and claims about krill's ecological role were corroborated with primary scientific literature (Cavan et al., 2024).

The State–Corporate Environmental Crime Framework

From a conventional legal perspective, krill fishing is largely compliant with the rules set by CCAMLR and its members (ASOC, 2025). However, as one researcher says, “this is precisely the problem” (Capurro, 2025). It is vital to scrutinise activities that fundamentally damage ecosystems, regardless of their legal status. Green criminology provides a framework for doing exactly this, as it is not restricted to legally codified offences. Rather, it encompasses the identification and exposure of environmental problems and harms that fall within lawful practice, yet are demonstrably injurious to ecological systems and their dependent communities (Brisman & South, 2021; White, 2022). Green criminological approaches include recognition that, in a globalised world, what may be illegal or prohibited in one jurisdiction or place may not be so categorised or regulated in another – a dynamic of particular salience when activities occur in international commons such as the Southern Ocean (Garcia Ruiz et al., 2020; Hübschle & Berg, 2024; Johnson et al., 2016).

To analyse the krill fishery, this article employs a state–corporate crime framework. This approach examines the intersection of corporate and government interests and its role in producing egregious harm (Kramer et al., 2002; Bradshaw & Kramer, 2014). State–corporate crime refers to illegal and/or socially or ecologically injurious actions that occur when one or more institutions of political governance pursues a goal in direct cooperation with one or more institutions of economic production or distribution (Bradshaw & Kramer, 2014; MacManus, 2020; Michalowski & Kramer, 2006). The concept spans both illegal acts, and social and ecological harms that, while technically lawful, have detrimental consequences to ecosystems (see also Passas, 2005). State-facilitated corporate crime occurs when governmental institutions fail to create regulatory structures capable of restraining injurious business activities – either through direct collusion with industry or because of shared goals, whose attainment would be hampered by robust regulation (Michalowski & Kramer, 2006). Environmental scholars have fruitfully applied the state–corporate crime framework to issues such as climate change, deforestation, illegal fishing and hazardous waste trading (Barigbon, 2023; Kramer & Michalowski, 2012; Lynch et al., 2013; Morelle-Hungría & Serra-Palao,

2024). This article extends it to conduct in the Southern Ocean commons by examining the overlap between actors involved in krill fisheries and Southern Ocean governance.

The applicability of a state–corporate crime framework to resource extraction in international waters is reinforced by comparative cases. Barighon (2023) demonstrates that in the Niger Delta, Nigeria, the close relationship between the state and multinational oil corporations has produced a regulatory architecture that nominally prohibits environmental violence while permitting it in practice – a pattern in which shared economic interests override effective enforcement. Bedford et al. (2022) show how similar dynamics operate in the context of deep-sea mineral extraction, where industry has engaged in what amounts to regulatory capture of international intergovernmental bodies – inserting corporate representatives into state delegations and shaping licensing regimes at multilateral forums. These comparative cases illuminate the structural pathways through which state–corporate collusion enables the degradation of global commons that are formally protected by international law. The krill fishery, managed by an institution that operates through consensus and is thus particularly susceptible to the blocking power of fishing-nation members, exhibits analogous dynamics.

Understanding the patterns by which powerful states and corporations exploit global commons for profit, while regulatory bodies fail to act, requires frameworks attentive to the structural inequalities and colonialist logics that shape international environmental governance (Goyes et al., 2024; Whyte, 2014). In their analysis of fresh water commodification Johnson et al. (2016), demonstrate through the treadmill of production theory how market-oriented approaches systematically prioritise capital accumulation over environmental sustainability, producing regulatory voids that enable ongoing harm. These insights apply with equal force to the commodification of Southern Ocean krill, where the same logic of expanding extraction in the global commons, driven by profit and protected by institutional inertia, is at work.

Green criminologists have documented how environmental regulatory regimes are frequently shaped by industry interests and how definitions of environmental crime often exclude the most destructive activities when they are carried out with the approval of the state (Brisman & South 2021; Morelle-Hungría, 2020, 2024; White, 2011). As South (2014) observes, the problem is not only legally defined crimes, but *legally perpetrated harms*. Powerful actors have relative impunity to harm the environment because they can extract resources legally, regardless of harm; their elite position gives them the capacity to influence laws and regulations. From a green criminology viewpoint, serious environmental harm ought to be treated as “criminal” when these acts threaten ecological well-being. This is the essence of a green criminology perspective (Brisman & South, 2021; White, 2022).

The concept of state–corporate crime provides a useful analytical instrument for examining the specific institutional dynamics at play in the krill fishery. The framework includes consideration of state-initiated corporate crime, where corporations act at the direction or with the tacit approval of government, and state-facilitated corporate crime, which occurs when government institutions of social control fail to create regulatory structures capable of restraining injurious business activities, either through direct collusion or because they adhere to shared goals whose attainment would be hampered by aggressive regulation (Kramer et al., 2002, p. 272). It is the contravention of the spirit, if not the letter, of law (based on specific notions of morality, harm and justice) that constitutes the core of the analysis applied here to krill fisheries governance.

With reference to the harms associated with krill extraction, this article includes exploration of motives, opportunities, means and consequences:

- Motives – what benefits do states and corporations seek (e.g., profits, food security, geopolitical influence, market expansion in high-value omega-3 and aquafeed industries)?
- Opportunities – what regulatory gaps or collusive arrangements allow harm to occur (e.g., CCAMLR’s consensus-based decision-making, absence of spatially fine-tuned quotas, use of scientific uncertainty arguments to delay protective measures)?
- Means – what actions or omissions by state agencies and firms produce the harm (e.g., deploying continuous-uptake fishing vessels, vetoing protective Conservation Measures, providing subsidies, resisting binding spatial protections)?
- Consequences – what environmental damage results from these acts and omissions (e.g., decreased predator populations, spatial concentration of fishing impact in penguin breeding zones, reduced carbon sequestration, undermining of ecosystem functioning)?

In their life-cycle assessment of Antarctic krill-derived products, Parker and Tyedmers (2012) highlight that the krill fishery serves markets in aquaculture, nutraceuticals and pet food, not food security, while burning approximately 190 litres of fossil fuel per tonne of raw krill landed – markedly higher than other reduction fisheries. This renders the krill fishery a particularly telling example of what Johnson et al. (2016) describe as the treadmill of production in action: expanding market demand drives

extraction of a global commons at rates that the ecosystem cannot absorb, with regulatory bodies – whose member states hold direct economic interests in the fishery – structurally incapable of imposing meaningful constraints.

Concepts of environmental, ecological and species justice are also relevant to green criminology (White, 2013, 2022). These frameworks ask us to reconsider who the victims of environmental harm might be, and whether their victimisation is addressed or ignored by existing power structures. In Antarctica, the victims include krill populations being extracted at unprecedented rates; krill-dependent species such as whales and penguins suffering food shortages and direct harm from fishing activities; and, more broadly, global communities insofar as krill loss exacerbates climate change by reducing the biological carbon pump, thereby victimising future generations. Barigbon (2023) notes that “the environment is the principal victim of environmental crime,” a category broad enough to encompass non-human species, nature itself and the future generations whose inheritance is being foreclosed by present extraction. A green criminological framework asserts that failing to safeguard these victims is an injustice that criminology should seek to understand and remedy, even when traditional law does not recognise the wrongdoing.

In some cases, the state–corporate nexus violates the law (for instance, corruption or illegal resource extraction); in other cases, it operates within the law but in ways that fundamentally betray the state’s duty to protect the public interest or the environment (Michalowski & Kramer, 2006). In both instances, the synergy between state policy/inaction and corporate pursuit of profit is decisive – neither the corporation nor the state could likely commit the harm alone, or at least not at the same scale. As the sections below demonstrate, the governance of Antarctic krill fishing exemplifies this synergy in both its active and passive forms: in the active pursuit of commercial interests by fishing-nation member states within CCAMLR, and in the structural inability of a consensus-based institution to impose protective measures against the resistance of those same interests.

Krill within the Southern Ocean Ecosystem

Antarctic krill have played a vital and irreplaceable role in Southern Ocean food webs; they are an established keystone species (Freer et al., 2025; Riaz et al., 2023; Santora et al., 2014). The Antarctic marine ecosystem is generally considered to be structured by krill. Predators, including finfish, cephalopods, marine mammals and seabirds, are all dependent to a greater or lesser extent on krill for their survival. Antarctic krill form enormous swarms, appearing as dense pink clouds in the water that can span several hectares, and their global biomass is estimated to lie somewhere in the range of 340–540 million tonnes, probably greater even than the total biomass of all humans on Earth. These dense aggregations make krill easy targets for modern fishing vessels with continuous uptake technology. The krill stock is one of only a few remaining under-exploited sources of marine protein in the world, a fact that simultaneously explains the commercial pressure to expand the fishery and the ecological stakes involved in doing so (Godø & Trathan, 2022; Trathan et al., 2025).

Krill sustain virtually all higher Antarctic predators. Baleen whales, which were decimated by twentieth-century industrial whaling, historically consumed even larger quantities of krill before their populations were severely reduced. Pre-whaling populations of blue, fin, humpback and minke whales in the Southern Ocean would have consumed approximately 430 million tonnes of krill annually, which is roughly double the current estimated total krill biomass. As whale populations recover, they represent a growing competitor for krill alongside fishing fleets and other marine predators. Pressure on krill stocks is increasing from multiple directions simultaneously. Murphy et al. (2007) showed that total krill demand across predator communities in the Scotia Sea alone, including macaroni penguins, Antarctic fur seals, crabeater seals, chinstrap penguins and whales, is estimated to range between 17.2 and 25.3 million tonnes per year. The crabeater seal (*Lobodon carcinophagus*), with an estimated diet greater than 90 per cent krill by mass and a population numbering in the millions, alone consumes on the order of 80 million tonnes of krill per year (Taylor et al., 2025). Seal and penguin populations rely on dense krill aggregations to feed their young, and fish and squid species also depend on krill at various life-stages. There is a well-established link between krill availability and penguin breeding success: in years of low krill abundance, penguin chick weights and survival drop significantly (Trivelpiece et al., 2011), and chinstrap penguin populations are now in decline partly as a consequence of recovering whale populations competing for the same krill resource (Murphy et al., 2007).

The geographic distribution of krill has shifted southwards over the last 40 years as a result of warming in the northern parts of its historical range. Krill densities have significantly declined at the northern end of their range, towards sub-Antarctic islands such as South Georgia (Atkinson et al., 2019). Additionally, the population structure is skewing towards larger, older individuals, indicating that fewer young krill are surviving to replenish stocks. This is correlated with the increasing frequency of positive Southern Annular Mode (SAM) events – climate shifts that bring warmer, windier conditions and reduced sea ice extent to the region (Atkinson et al., 2019). The west Antarctic Peninsula is a key krill habitat; it is also among the fastest-warming places on the planet. Winter air and sea temperatures have risen and sea-ice cover has shrunk markedly over the past half-century (Atkinson et al., 2019). Krill have a complex life-cycle that is tightly linked to sea ice: juvenile krill depend on ice

algae growing on the underside of sea ice for winter food and shelter, so declines in winter sea-ice duration can therefore reduce juvenile survival, leading to poor recruitment of young krill into the population. Naganobu et al. (1999) demonstrated that the strength of westerly winds across the Drake Passage (the Drake Passage Oscillation Index) is a significant predictor of krill recruitment, operating through its effects on sea-ice extent and primary production: years of strong westerlies produce favourable recruitment conditions, while years of weak westerlies coincide with recruitment failures. Given that climate change is already modifying both the westerly wind regime and sea-ice dynamics across the Southern Ocean, the environmental baseline underpinning krill productivity is itself in flux (Godø & Trathan, 2022; Murphy et al., 2007).

From a fisheries management perspective, the Southern Ocean's vulnerability to climate change has critical implications. In a krill-poor year, the same nominal catch represents a larger proportional removal from a reduced standing stock, effectively constituting overfishing even if it falls below the established trigger level of 620,000 tonnes. If there are successive poor recruitment years due to warm conditions, continuing to fish at maximum allowed levels could drive down krill abundance below the threshold needed to sustain predator communities. Models suggest that if warming trends continue and krill biomass falls further, the effective fraction of stock being removed by fishing will rise accordingly (Taylor et al., 2025). This interaction between climate stress and fishing pressure is precisely what the current management framework – with its fixed, spatially blunt catch limit unchanged since 1991 – is structurally ill-equipped to address (Trathan et al., 2025).

Krill depletion can generate cascading ecological effects that reverberate across the entire Southern Ocean food web. Murphy et al. (2007) documented how periods of reduced krill biomass around South Georgia produce catastrophic mortality of predator offspring, with foraging trips becoming extended as seals and penguins search further offshore for prey – a pattern that itself imposes additional energetic costs and physiological stress on breeding populations. The spatial concentration of the modern krill fishery alongside predator foraging areas, particularly in coastal Subarea 48.1 around the Antarctic Peninsula and South Shetland Islands, means the fishery is competing directly with land-based predators in the areas where krill aggregations are most predictable and where ecological stakes are highest (Godø & Trathan, 2022; Trathan et al., 2025).

A less-visible but globally significant harm from krill depletion is the potential reduction in carbon sequestered (ASOC, 2022). Krill's feeding and defecation habits are integral to the biological carbon pump: as krill consume phytoplankton in surface waters and produce large, rapidly sinking faecal pellets, they transfer carbon from the productive surface ocean to deep waters and sediments (Cavan et al., 2024). Antarctic krill faecal pellets are estimated to sequester approximately 20 million metric tonnes of carbon per year in the Southern Ocean, given the massive krill standing stock (Cavan et al., 2024). Murphy et al. (2007) confirmed that krill generate large faecal pellets, which sink quickly, rapidly removing carbon to depth; this contrasts with the finer waste material of copepods, which sinks more slowly, making krill a disproportionately important vector in the biological carbon pump. If industrial fishing significantly reduces krill density, it will proportionally reduce this carbon sink service – adding a global climate dimension to what is already an acute regional ecological crisis (Cavan et al., 2024). Parker and Tyedmers (2012) point to the irony here: the krill fishery itself burns approximately 190 litres of fossil fuel per tonne of raw krill landed – markedly higher than other reduction fisheries – which means the extraction of a species crucial to carbon sequestration is itself a significant source of greenhouse gas emissions. In this sense, krill extraction inflicts a double climatic harm, both removing a critical carbon sink and contributing directly to the atmospheric greenhouse gas concentrations that are destabilising the Southern Ocean ecosystem.

CCAMLR's Management of Krill Fishing

CCAMLR and its members are responsible for managing krill fishing in the convention area. Where vessels are allowed to fish depends on their CCAMLR permit, CCAMLR rules, the availability of krill and the accessibility of krill habitat for vessel access. CCAMLR subdivided the 620,000-tonne overall catch limit for Area 48 into smaller subareas under Conservation Measure 51-07 (CM 51-07). The four main subareas are 48.1, 48.2, 48.3 and 48.4, and most of the catch has historically been concentrated within the first three. CM 51-07 allocated fixed maximum proportions to each subarea: 25 per cent (155,000 tonnes) in Subarea 48.1, 45 per cent (279,000 tonnes) in Subarea 48.2, 45 per cent (279,000 tonnes) in Subarea 48.3 and 15 per cent (93,000 tonnes) in Subarea 48.4, although the total allowable under the trigger level of 620,000 tonnes remained the binding upper ceiling. Subarea 48.1 encompasses the slope areas of the Antarctic Peninsula, one of the fastest-warming marine ecosystems on Earth, where species face the combined pressures of industrial extraction, accelerating climate change and increased tourist vessel traffic. Subarea 48.2 encompasses the South Orkney Islands and much of the Scotia Sea, which are home to the breeding grounds of various marine species, while Subarea 48.3 surrounds the South Georgia Islands and hosts diverse seabird colonies above sea level and rich benthic communities below (Trathan et al., 2025).

Table 1*Flag State, Vessel Name, and Licensed Subareas for the 2024–2025 CCAMLR Fishing Season*

Flag state	Vessel name	48.1	48.2	48.3	48.4
Chile	<i>Antarctic Endeavour</i>	x	x	X	
China	<i>Fu Xing Hai</i>	x	x	X	X
China	<i>Hua Xiang 9</i>	x	x	X	X
China	<i>Fu Yuan Yu 9199</i>	x	x	X	X
China	<i>Long Fa</i>	x	x	x	X
China	<i>Shen Lan</i>	x	x	x	X
Namibia	<i>More Sodruzhestva</i>	x	x	x	
Norway	<i>Antarctic Endurance</i>	x	x	x	X
Norway	<i>Antarctic Sea</i>	x	x	x	X
Norway	<i>Saga Sea</i>	x	x	x	X
Korea, Republic of	<i>Sae In Leader</i>	x	x		
Korea, Republic of	<i>Sejong</i>	x	x	x	

Five states drive krill extraction in the Southern Ocean under the auspice of CCAMLR’s management. All vessels fishing for krill must have authorisation from CCAMLR and their flag state. In the 2024–2025 season, 12 vessels were involved; all were permitted to fish in Subareas 48.1, 48.2 and 48.3, although not all were authorised for Subarea 48.4. China and Norway have the most vessels – six and three respectively. Most of the states currently involved in krill fishing have announced their plans to expand their krill fleets. Norway and China have announced plans to add new vessels over the next five years (de Augustinis, 2025; Godfrey, 2025a). India has also announced that it will begin licensing krill fishing vessels for the first time (Tejonmayam, 2025). In 2024, Russia had a vessel, the *Comodor*, licensed to fish for krill, but it was not deployed to the Southern Ocean in either the 2024 or 2025 season (CCAMLR, 2024; Trathan et al., 2025). The fishery for krill shows no signs of slowing – in fact, the opposite is true. Companies fishing for krill are planning to expand and are being supported by the CCAMLR member countries within which they are registered (Chavez-Molina et al., 2025).

Changes in Krill Catch and Spatial Distribution

There are two leading ecological concerns with current krill fishing: the rapid increases in catch (ASOC, 2025; Capurro, 2025); and the failure to equally distribute catch as recommended by CCAMLR’s Scientific Committee (Meyer et al., 2025; Santa Cruz et al., 2022). CCAMLR’s Working Group on Ecosystem Monitoring and Management (WG-EMM) has recommended more fine-scale management for krill fisheries, including moves towards small-scale catch limits and seasonal closures to ensure predators have sufficient access to krill (CCAMLR, 2018). These recommendations have never been translated into binding conservation measures, illustrating precisely the form of regulatory failure that state–corporate crime scholarship identifies: scientifically grounded protective guidance ignored in favour of commercial interests (Johnson et al., 2016; Kramer & Michalowski, 2012).

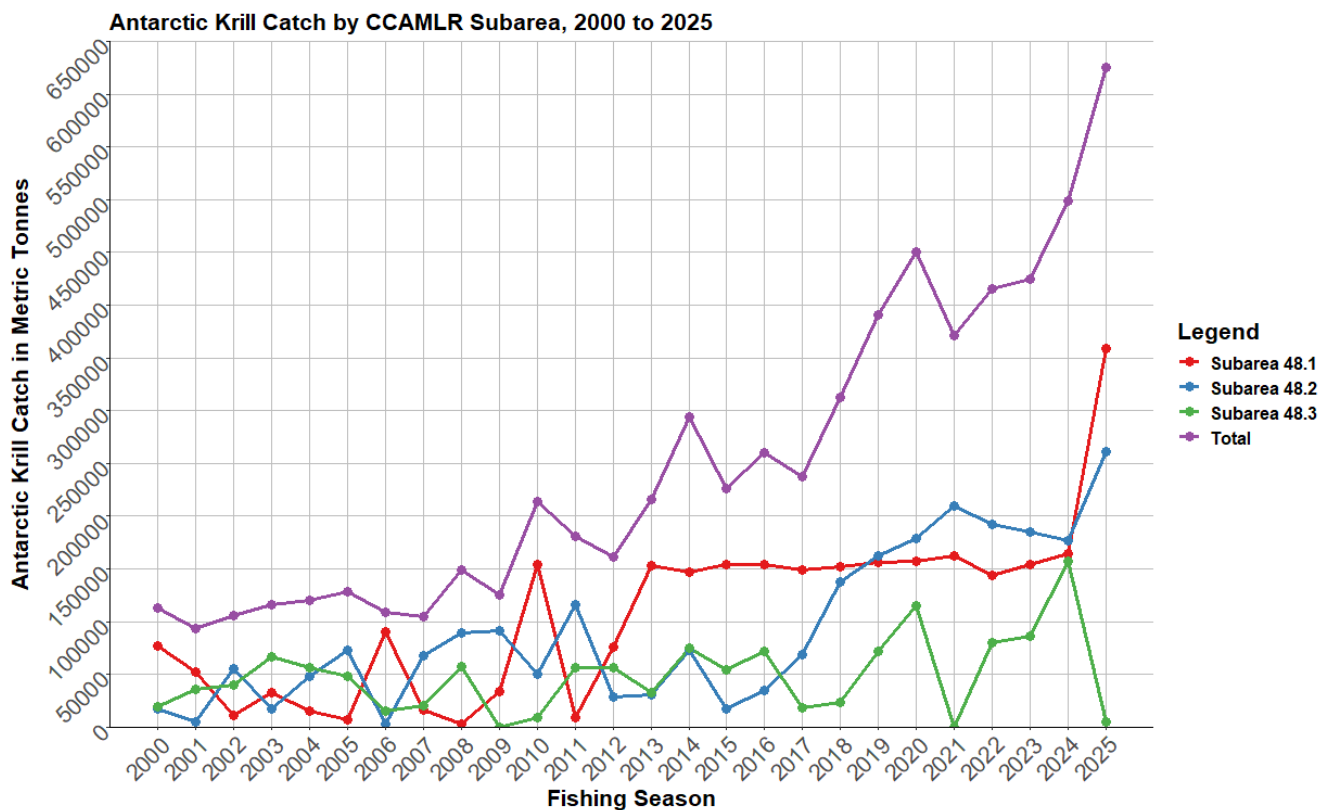
The scientific case for such measures has been made consistently for decades. Hewitt and Low (2000), in a foundational review of CCAMLR’s management framework, warned that once fishing interests had invested in fishery capital, they would be “reluctant to incur economic losses” and that “relaxing overly protective controls in the future may be far easier than strengthening weaker conservation measures” – a prediction that has been borne out with striking accuracy by the events of 2024–2025. They also documented that, in CCAMLR’s early years, powerful fishing nations deliberately invoked scientific uncertainty as grounds for blocking conservation measures, acting on the presumption that no management action should be taken unless it was certain to benefit the fishery (Hewitt & Low, 2000). Hart et al. (2015), writing a decade and a half later, noted that progress in establishing marine protected areas around East Antarctica and in the Ross Sea had “stalled”; they proposed temporary experimental fishery closures as a mechanism for disentangling the effects of krill fishing from those of

climate change and cetacean recovery on predator populations, a proposal CCAMLR has never adopted in binding form. The persistence of this gap between scientific recommendation and regulatory action across a period spanning more than 25 years is itself evidence of the structural regulatory failure analysed in this article (Cappell et al., 2022).

Figure 1 presents CCAMLR's publicly available estimates of krill catch for the period 2000–2025 across Subareas 48.1, 48.2, and 48.3, overlaid with combined total catch per CCAMLR fishing season. Subareas 58.4.1 and 58.4.2.2 are excluded from the subarea-level lines as they have had comparatively low rates of catch, although their catch is included in the “Total” figures reported in 2017, 2018 and 2019 by CCAMLR. Given current data availability, this figure includes only the catch from Subarea 48.1 and total catch from CCAMLR Area 48 for recent seasons.

Figure 1

CCAMLR Antarctic Krill Catch (tonnes) by CCAMLR Subarea and Season, 2000–2025



Note: This is a collection of CCAMLR's publicly available estimates of krill catch from 2000 to 2025 across Subareas 48.1, 48.2 and 48.3 overlaid with combined total catch across fishing seasons. Subareas excluded from this figure are Subareas 58.4.1 and 58.4.2.2, which have had comparatively low rates of catch. These divisions are included in the total catch reported in 2017, 2018 and 2019 by CCAMLR so their catch is included in the “total” catch reported.

Until 2024, Conservation Measure 51-07 allocated spatially distributed catch limits for each CCAMLR subarea alongside the overall 620,000-tonne trigger level under CM 51-01. However, a failure to reach consensus at the CCAMLR 2024 annual meeting led to the expiry of CM 51-07 without an agreed renewal or replacement. This expiry has been described as a “retrograde management step,” with serious implications for the ecosystem. Foraging and breeding grounds previously barred from intensive fishing can now be exploited far more heavily than neighbouring subareas. The immediate response from krill fishing members has been an intensification of fishing efforts and record catch levels concentrated in Subarea 48.1 surrounding the Antarctic Peninsula. Subarea 48.3 experienced variability throughout the monitoring period, but was never the primary target. Subarea 58.4.2 has consistently seen less than 100 metric tonnes removed and has not been fished at all in some seasons. Overall, there is a clear upward trend in krill extracted: from 2012 to 2018, Subarea 48.1 was the primary target of industrial krill harvest, but catch was reasonably distributed between zones. Since 2018, fishing effort has concentrated heavily on

Subareas 48.1 and 48.2. In 2025, over half of the catch came from Subarea 48.1 (ASOC 2025). All of this is technically compliant with CCAMLR's current conservation measures following the expiry of CM 51-07 (Godø & Trathan, 2022; Meyer et al., 2025).

The failure to renew CM 51-07 is not an isolated administrative lapse; rather, it reflects a broader pattern of regulatory dysfunction building in CCAMLR. As Godø and Trathan (2022) document, fishing nations have repeatedly used CCAMLR's consensus requirement to block spatial management measures, effectively exploiting the institution's procedural architecture to prevent any restriction on where within Area 48 they fish. This mirrors the dynamic observed by Bedford et al. (2022) in the context of deep-sea mineral extraction, where international intergovernmental bodies have been subject to regulatory capture – with their nominal protective mandates progressively hollowed out through the insertion of corporate and state commercial interests into the governance process. In each case, the formal architecture of international law provides a veneer of legitimacy while enabling ongoing ecological harm. The voluntary buffer zones (VBZ) introduced in 2018 by the Association of Responsible Krill Harvesting Companies (ARK), restricting fishing near penguin colonies during the breeding season, represented an industry-led attempt to fill the regulatory void left by CCAMLR's failures, but they are no substitute for binding *de jure* measures and they explicitly cover only a subset of ecological vulnerabilities.

The southward contraction of krill caused by ocean warming means fishing vessels and krill-dependent predators are increasingly competing for the same contracting habitat. Of particular concern are fisheries that overlap with established vulnerable marine ecosystems. Most of these are found in Subareas 48.1 and 48.2, which carry elevated ecological risk of bycatch, destruction of non-target species and overfishing of areas with sensitive pre-existing ecosystems. Five humpback whales have been killed in interactions with krill vessels since 2016 (Gibson, 2024). CCAMLR scientists have long recognised these risks: penguin breeding success and chick growth were significantly lower in years and locations where krill fishing pressure was high (Watters et al., 2020). The precautionary principle, which CCAMLR nominally endorses, would require protective action in conditions of ecological uncertainty rather than waiting for definitive proof of harm, yet this principle has consistently been subordinated to commercial interests within the institution (Bender, 2006; Trathan et al., 2025).

Local depletion can cause substantive local damage even if the overall stock is not overfished. Scientists have repeatedly called for spatial limits on catch, particularly in Subarea 48.1 (Meyer et al., 2025; Reisinger et al., 2022; Riaz et al., 2023; Santa Cruz et al., 2022). The intensification of fisheries in Subarea 48.1 is in direct contradiction to Scientific Committee guidelines and is unprecedented in CCAMLR's history (Riaz et al. 2023; Santa Cruz et al., 2022; Warwick-Evans et al., 2022). This contradiction – between CCAMLR's own scientific advice and the conduct of its fishing-nation members – is the structural heart of the state–corporate crime argument developed in this article. The failure of states engaged in Antarctica to implement binding spatial protections requires urgent examination and remedying to prevent further damage to krill populations, especially in the ecologically critical Subarea 48.1 (Godø & Trathan, 2022; Trathan et al., 2025).

State and Corporate Drivers of Krill Fishing

The patterns of exploitation observed in the CCAMLR krill fishery reflect a broader dynamic of environmental harm produced by the intersection of political and economic power in the Southern Ocean. A handful of powerful corporate actors and the states that sponsor them engage in this fishery under the nominal management of CCAMLR. Norway's Aker BioMarine, for example, has positioned itself as the world's dominant krill-harvesting company, operating advanced factory trawlers under the Norwegian flag, while China has recently expanded its krill fishing fleet as part of a state-supported drive to secure new protein sources. South Korea, Chile and a small number of other nations also maintain krill vessels, but Norway and China account for the bulk of the catch. These actors are not peripheral market participants; they are nodes in a global political economy of extraction that treats the Southern Ocean commons as an open-access resource available for privatised benefit (Trathan et al., 2025).

From a critical green criminological perspective, this configuration of extraction involves identifiable victims and perpetrators. The Antarctic ecosystem, global climate stability, krill-dependent species and dependent coastal communities constitute the victims; the perpetrators are networks of states and corporations whose interests converge around uninterrupted resource access. This aligns with green criminology's foundational project of expanding the scope of harm beyond legal definitions to encompass environmental, species and intergenerational injustices. States party to CCAMLR, formally charged with the role of ecological stewards under the Antarctic Treaty system, have instead enabled ecological plunder through inaction, selective invocation of scientific uncertainty and the exploitation of consensus-based governance structures. These dynamics illustrate what the literature describes as a criminology of omission: the knowing toleration of foreseeable harm in the absence of adequate enforcement or accountability (Michalowski & Kramer, 2006; Kramer & Michalowski, 2012; South, 2014).

The concept of state–corporate crime is instructive here because it identifies not only acts of commission, but also acts of omission – cases where state or governmental bodies knowingly fail to prevent harmful corporate conduct (Kramer & Michalowski, 2012). This logic of omission applies directly to krill governance. A state party to CCAMLR might technically comply with its rules while, in collusion with industry, blocking improvements to those rules despite scientific warnings; the resulting ecological harm is a foreseeable consequence of that state inaction. When powerful actors knowingly choose not to prevent catastrophic environmental harm, such “lack of action” in the face of ecological crisis should be understood as criminal. This article extends this reasoning to the Antarctic context by asking whether states’ failures to strengthen krill protections, under industry pressure and driven by economic motives, constitute blameworthy harm in this sense.

The extraction of krill can therefore be conceived as a form of state-facilitated corporate crime. The hallmarks of such crime in this case include:

- a *harmful outcome* – measurable ecological degradation in the form of krill depletion, predator population declines and disruption of the Southern Ocean carbon cycle
- *hybrid responsibility* – the involvement of both corporate actors (fishing companies) and state actors (government agencies, CCAMLR delegates) in causing or permitting the harm
- *motivation* – a mix of profit for corporations and political-economic benefit for states (revenue, food security, geostrategic presence in the Antarctic)
- *violation of duty* – states’ failure to uphold their conservation obligations under international law and the public trust, even where no explicit legal rule is broken, and
- *institutional context* – a regulatory system possessing the formal mandate to prevent such harm (CCAMLR’s conservation mandate) but systematically undermined by the very actors tasked with implementing it.

Crimes of the powerful transcend national boundaries and operate in transnational ways – on the high seas, international commons, polar regions – all of which are governed by patchy and easily exploited legal frameworks (Twyman-Ghoshal, 2012, 2019). This is a key insight of “blue criminology,” which deals with maritime-related harms (Garcia Ruiz et al., 2020). This includes recognition of the intrinsic rights of the ocean (in the same vein as the “rights of nature”). Investigation of harms pertaining to maritime spaces includes consideration of the vastness of international waters and complexity of governance in such spaces (Hübschle & Berg, 2024). The Southern Ocean krill fishery is precisely such a transnational space of interaction between states and companies.

The parallel case of deep-sea mineral extraction is instructive. Bedford et al. (2022) demonstrate how mining companies engaged in the apparent regulatory capture of the International Seabed Authority (ISA), inserting corporate representatives into state delegations to international meetings and thereby shaping licensing regimes at the multilateral level in their own interests. In one documented instance, representatives of a mining company attended an ISA Council session seated under their sponsoring state’s flag and spoke from the seat marked for that state. This case reveals structural mechanisms – a corporate infiltration of state delegations, greenwashing strategic use of scientific uncertainty – that are directly applicable to the krill fishery context, where fishing industry representatives routinely attend CCAMLR meetings and, in some cases, are embedded within national delegations. Regulatory capacity is systematically eroded by the joint venture relationship between the state and the corporations it is supposed to regulate. This dynamic maps onto CCAMLR’s predicament with notable precision: states within CCAMLR are simultaneously regulators and resource users, a dual role structurally ripe for conflict of interest.

In 2018, the Association of Responsible Krill Harvesting companies (ARK) voluntarily agreed to avoid fishing near penguin colonies during breeding season (Greenpeace International, 2018). Although voluntary, this concession demonstrates that krill companies can acknowledge the need to monitor and adjust their activities near predator hotspots. However, the intensification of fishing in ecologically sensitive subareas following the lapse of Conservation Measure 51-07 demonstrates that relying on industry goodwill is not an effective long-term strategy. As Johnson et al. (2016) argue in their analysis of fresh water commodification, self-regulatory approaches driven by market-oriented models are incapable of reversing ecological disorganisation because capitalism’s expansion is intrinsically environmentally destructive – the treadmill of production does not stop voluntarily. The conclusion that clear, consistent, externally enforced regulatory standards are necessary for protecting vulnerable ecosystems and keystone species follows directly from this analysis (Godø & Trathan, 2022).

State–corporate collusion in CCAMLR can operate in subtle as well as direct ways: through industry lobbying at international meetings, through scientific committees dominated by experts affiliated with fishing-state interests and through quid pro quo arrangements between countries – votes traded for fishing access or for support in unrelated diplomatic forums (Godø & Trathan 2022). Countries including China and Russia have repeatedly vetoed the establishment of marine protected areas and stricter

catch limits (Godfrey 2025b), while states with commercial interests, such as Norway and South Korea, have promoted the narrative that the fishery is precautionary and sustainable, emphasising that current catches take only approximately 0.5 per cent of the estimated krill biomass (FoodTank, 2024). Critics argue that this narrative ignores the localised, ecologically concentrated nature of fishing impacts and the rapidly changing context of climate change (Trathan et al., 2025; Godø & Trathan, 2022). Hart et al. (2015) identified precisely this problem: the inability of confounded variables and the unavailability of fine-scale fisheries data in the Western Antarctic Peninsula to isolate the specific contribution of krill fishing to predator population change creates a *de facto* presumption of regulatory permissibility – one that fishing nations have consistently exploited as grounds for delaying protective measures. This is not a knowledge gap passively awaiting resolution; it is a governance gap that has been structurally maintained over decades. Hewitt and Low (2000) observed the same mechanism in CCAMLR's founding years: fishing nations treated the absence of definitive proof of harm as a sufficient justification for inaction, inverting the precautionary principle that CCAMLR's own Convention mandates. Thus, what might appear to be a benign, well-regulated fishery on paper could be causing serious ecological harm – harm that is politically enabled, manufactured as uncertain and largely invisible in legal terms.

These structural dynamics are consistent with patterns identified by Goyes et al. (2024) in their examination of environmental crime and harm in the Global South. As Goyes et al. argue, contemporary green crimes do not exist in a void: they are products of, or at least contextualised within, long trajectories of extraction, colonialism and the exploitation of commons by powerful states and corporations. The former colonial powers are now joined by new entrants, including China, that are strongly embracing the logics and practices of extractive imperialism. The Southern Ocean krill fishery exemplifies this pattern: an international common formally protected by treaty law, governed by an institution susceptible to the blocking power of powerful fishing-nation members and subjected to escalating extraction by states whose domestic political economies prioritise economic growth over Antarctic conservation.

Patten (2019) finds in a quantitative study of corporate environmental violations that motivation to commit environmental harm, rather than opportunity or enforcement severity alone, is the strongest predictor of violation rates, and that weak sanctions rarely inhibit corporate offending. This insight is directly relevant to the analysis of krill fisheries regulation. The fines and catch limits currently operating within CCAMLR's framework do not constitute credible deterrents for corporations whose expected profits from expanding harvests vastly exceed the costs of regulatory non-compliance or diplomatic friction. Structural reform, increased transparency and genuinely science-based management are therefore urgently needed in krill governance.

Conclusion

In Antarctica, there is a fundamental tension between states as political actors nominally responsible for the stewardship of global commons and corporations as profit-driven actors actively producing ecological harm. Conversely, there is direct and indirect collusion between these same states and corporations in fostering, accelerating and compounding that harm. Despite the ostensibly strict management regime of CCAMLR, mounting concern in the scientific and environmental community indicates that krill fishing is outpacing the ecosystem's limits and undermining Antarctica's ecological integrity (Godø & Trathan, 2022; Trathan et al., 2025). The first seven months of the 2024–2025 season produced the largest krill catch ever recorded, exceeding the precautionary catch limit for the first time in CCAMLR's history – a threshold that had stood uncrossed for 34 years (Trathan et al., 2025). That this occurred not in defiance of the regulatory regime but in full compliance with it, following the lapse of Conservation Measure 51-07 without an agreed replacement, captures the essential problem this article has set out to analyse.

This article has argued that significant issues are apparent with respect to the governance of the krill fishery in Antarctica and the Southern Ocean, and that these issues are best understood through the lens of state–corporate environmental crime. Applying this framework to all three of the article's declared aims yields consistent and troubling findings. First, the expansion of krill harvesting has proceeded because powerful fishing nations – particularly Norway and China – have been able to exploit CCAMLR's consensus-based governance architecture to block binding spatial and precautionary management measures, while their corporate partners have invested in continuous-uptake harvesting technology that maximises catch in the window before protections are imposed. Second, the ecological impacts are measurable, cumulative and compounding: reduced predator food availability, disrupted penguin breeding, fatal whale entanglement, a diminished biological carbon pump and an accelerating interaction between fishing pressure and climate-driven habitat contraction all constitute foreseeable and documented harms. Third, these dynamics meet the criteria of state-facilitated corporate crime: harmful outcome, hybrid responsibility, mixed motive, violation of duty and an institutional context whose formal protective mandate has been progressively hollowed out by the actors charged with implementing it.

The evidence assembled here demonstrates that the failure of CCAMLR to protect the Southern Ocean from escalating krill extraction is not a technical failure of regulatory design, but a political failure produced by the convergence of state and corporate interests. Patten (2019) confirms that weak enforcement structures do not deter corporate environmental offending when motivation to extract is high: structural reform, not voluntary compliance, is what produces meaningful restraint. The parallel cases of state–corporate environmental harm documented by Barigbon (2023) in the Niger Delta, by Bedford et al. (2022) in deep-sea mineral governance, and by McDowell (2013) in hazardous waste siting all point to the same conclusion: shared economic interests between regulators and the regulated produce regulatory architectures that nominally prohibit harm while structurally enabling it. Goyes et al. (2024) situate these dynamics within longer trajectories of colonial resource extraction from global commons – a framing that applies directly to the Antarctic, where a formally protected international space has been opened to the extractive interests of powerful fishing nations with minimal accountability.

Failure to grapple with the short- and long-term sustainability of the krill fishery, and neglect of properly assessing the cascading consequences of krill population decline for dependent species, for global carbon cycling, and for the communities and ecosystems that rely on a functioning Southern Ocean, signal major problems both in the present and for future generations. The victims of this ongoing harm – krill populations, Antarctic predators, global communities whose climate stability depends in part on the Southern Ocean carbon pump, and future generations – have no voice in CCAMLR’s consensus chambers. As the concept of ecocide gains traction in international legal discourse, the large-scale, legally permitted destruction of a keystone species in a global commons warrants serious consideration as a candidate for formal legal recognition and accountability (Stop Ecocide Foundation, 2021).

Holding fisheries companies and nation-states to account is therefore vital if the killing of krill is not to have catastrophic ramifications, both ecologically and socially. Practically, this requires CCAMLR member states to urgently agree a binding successor to Conservation Measure 51-07, incorporating spatially differentiated, science-based catch limits; reform of the consensus requirement to prevent fishing nations from exercising an effective veto over conservation measures supported by CCAMLR’s own Scientific Committee; greater transparency regarding corporate affiliations of state delegates; and sustained political pressure from non-fishing member states, civil society and the scientific community to ensure that CCAMLR’s conservation mandate is implemented in substance and not merely in form. Criminologically, this case study illustrates how crimes of omission by powerful actors – states that know, are warned and choose not to act – can produce ecological harm at a scale and duration that dwarfs more conventionally recognised environmental offences. The Southern Ocean cannot wait another quarter of a century for the institutions charged with its protection to act.

AI Disclosure Statement

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