

## Article

# Introducing the Seasonal Closure into the CCAMLR Fishery Management Framework: Problems, Methods, and Prospects

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**Abstract:** In June 2020, China unilaterally announced two seasonal closures on squid fishing in certain areas of the high seas that apply to the Chinese distant water fishing fleets. Such closure refers to the withdrawal of the Chinese distant water fishing fleet from part of the high seas where they regularly operate. It is an innovative conservation measure initiated by a nation-state with the significance for global ocean governance and meeting the requirements from the UN Sustainable Development Goals. This paper is designed to seek the possibility, through a qualitative study and interpretive analysis, of whether such an innovative conservation measure can be introduced into the fishery management in the Southern Ocean, currently mainly under the framework of CCAMLR. This paper attempts to answer some questions with this new introduction. First, whether this kind of seasonal closure is applicable or feasible within the framework of CCAMLR. Second, whether this kind of seasonal closure would infringe upon or disrupt existing regimes, such as marine protected areas (MPAs) created by CCAMLR. Third, how and to what extent such a measure is supported by best scientific evidence so as to reach optimal effectiveness. In this regard, firm support from contracting parties is necessary to enforce the seasonal closure within the coverage of CCAMLR. The paper concludes that the seasonal closure feasible under the CCAMLR legal framework, which, like the measures of MPAs, will facilitate the fulfillment of best scientific evidence and eventually contribute to the SDG-14 progressively in the Southern Ocean.

**Keywords:** seasonal closure; CCAMLR; MPAs; RFMOs; conservation measures; China



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## 1. Introduction

On 2 June 2020, the Ministry of Agriculture and Rural Affairs of the People's Republic of China (MARA) issued the "Notice to enhance the conservation of squid stocks on the high seas in order to promote the sustainable development of China's distant water fishing" (hereinafter referred to as the Notice) [1]. According to the Notice, Chinese fishing vessels were not allowed to enter into certain areas or engage in any fishing activities in the east-western Atlantic and east Pacific during two separate periods of time, respectively, from 1 July to 30 September (32° S–44° S, 48° W–60° W) and from 1 September to 30 November (5° N–5° S, 110° W–95° W) [1]. The Notice essentially imposes the seasonal closure of squid fishing in certain parts of the high seas on a Chinese voluntary basis without regulation from any Regional Fishery Management Organizations (RFMOs) and only binds the Chinese fishing vessels [2]. After the successful completion of the first phase, the MARA was going to facilitate and promulgate this policy into different RFMOs [3]. This policy initiated by China, one of the largest distant water fishing (DWF) nations in the world, is probably helpful for the purpose to better conserve squid stocks on the high seas and contribute to the achievement of the UN Sustainable Development Goals (SDGs), especially SDG-14 [4]. Besides, this policy reflects China's intention to actively participate in global ocean governance and take more responsibility for global fisheries conservation and management.

Despite China's intention to introduce this innovative conservation measure into international fishery management organizations [5], many specific questions in scientific, legal, and political perspectives need to be asked, and they are, *inter alia*, the rationale between science and law, legal applicability, transnational cooperation, and the effectiveness of such a proposal. Preliminary studies shall be conducted while adopting seasonal closure in terms of RFMO/As, such as the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR Commission). The CCAMLR Commission, established by Article VII of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) [6], has adopted a series of conservation measures to maintain fisheries management in CCAMLR Area [7], mainly targeting krill (*Euphausia superba*), toothfish (*Dissostichus* spp.), and icefish (*Channichthyidae*), which are under commercial harvesting currently [8]. States Parties of CCAMLR can participate in the decision-making process and submit proposals to the fisheries management in the CCAMLR Area [9]. China is a member of the CCAMLR Commission [10] and one of the fishing states in the Southern Ocean [11]. Furthermore, China has its long-term interests in commercial exploitation of marine living resources in the Southern Ocean, especially krill [12].

This paper primarily aims to find any possibility to introduce China's recent seasonal closure practice into the CCAMLR regime based upon a qualitative process of a legal analysis of the rationale, legal basis, and foundations of such a proposal. Specifically, this paper attempts to answer relevant questions with this introduction. First, whether and how seasonal closure is applicable or feasible with CCAMLR. Second, why and how seasonal closure could strengthen existing conservation measures adopted by the CCAMLR Commission. Third, how and to what extent this seasonal closure proposal could be consistent with other regimes inside and outside of CCAMLR. Besides, this paper will finally explore a possibility of a proposal by China to push forward this conservation measure within the CCAMLR framework. To conclude, this paper tries to offer some preliminary observations on China's seasonal closure proposal in global ocean governance, especially for global fisheries management and sustainable fishing development.

## 2. Applicability of Seasonal Closure in the Southern Ocean

Abundant fishery resources exist in the Southern Ocean in which krill is the cornerstone of the food chain in Antarctica and also the key component of the whole Antarctic ecosystem [13]. Ecological and economic risks potentially caused by large-scale harvest of krill accelerated the law-making process of conservation of Antarctic marine living resources in the 1970s [14–17]. Efforts have been made by the Antarctic Treaty Consultative Parties (ATCPs) since 1975 [18]. After several sessions of negotiation, the final act was adopted unanimously by fourteen countries in 1980. Unlike other RFMOs, the goal of CCAMLR focuses more on conservation of marine living resources than sustainable exploitation through the ecosystem approach [19], which can be proven by the absence of catch allocation in conservation measures of CCAMLR [15] (pp. 139–140).

Article IX is the key clause with regard to conservation measures under the CCAMLR regime, which, in a uncompromising tone [14] (p. 356), provides that the CCAMLR Commission shall formulate, adopt, and revise conservation measures on the basis of the best scientific evidence available in order to give effect to objectives and principles of Article II [20] and subject to the provisions of paragraph 5 of Article IX, which requires consistency externally between CCAMLR measures and relevant measures established by other RFMOs that CCAMLR Contracting Parties acceded to [21]. In the meantime, recommendations and advice of the Scientific Committee (SC-CCAMLR) shall be taken under full consideration of the CCAMLR Commission exercising its functions [22]. Of course, designating open and closed seasons for harvesting, for instance, a seasonal closure, is one of the conservation measures confirmed by paragraph 2 of Article IX [23]. From the contextual perspective, paragraph 2 of Article IX also implicitly requires to ensure the internal consistency between conservation measures [24].

In practice, fishery regulations, as categorized by the CCAMLR Commission, comprise a series of measures for managing marine living resources in the CCAMLR area, including general measures, fishing season, closed areas and prohibition of fishing—by-catch limits—for toothfish, icefish, and krill [25]. Directed fishing over various kinds of species in different areas, subareas, and divisions [26] covering several marine areas of CCAMLR Area [27], and in the 2020/21 season for toothfish fishing in Subarea 48.5, is prohibited [28]. Besides, directed fishing on shark species in the CCAMLR Area is banned as well, with the exception of activities for scientific research purpose [29]. Such seasonal closures could be revised by the CCAMLR Commission on the basis of reports prepared by the Working Group on Fish Stock Assessment (WG-FSA) of SC-CCAMLR (see Figure 1).

As available options of conservation measures are provided by paragraph 2 of Article IX, it is hard to totally differentiate the seasonal closure that is also referred to as “open and closed season for harvesting” and the closed area that means “open and closing of area” [30]. Normally, three elements at least must be acquired if an appropriate management rationale is to be presented by the legitimate seasonal closure: respectively targeted species, certain marine areas, and specified period of time from the perspective of common practices. The Commission offers the definition of closed area as certain subarea and division where directed fishing on various taxa is prohibited, primarily in CM 32-02 [26]. The only term relating to the seasonal closure given by the Commission is the CCAMLR fishing season (CM 32-01) [31]. Another relevant term is the marine protected areas (MPAs), which can be found in several conservation measures (CMs 91-02, 03, 04, and 05) that will be well discussed below.

Accordingly, three basic requisites should be fulfilled if a seasonal closure would be adopted by the CCAMLR Commission. First, a conservation measure shall be subject to the objectives and principles set out in Article II of CCAMLR. Second, such a conservation measure ought to be made on the basis of the best scientific evidence available, which means the advice of the SC-CCAMLR plays an important role in this process. Third, the consistency, whether internal or external, must be tested prudently. The test of consistency is designed to determine, from the perspective of international law, whether a new conservation measure is compatible with other relevant existing measures, arrangements, and regimes. To fulfill the legitimacy of a proposal, it is necessary to do this test before submitting. There are two categories of consistency tests in this regard: the internal consistency and the external one. The internal consistency refers to the situation that a new measure proposed must not be in conflict with current provisions within a specific legal regime, while the external consistency means that such measure cannot hamper relating arrangements of similar regimes other than the Antarctic Treaty System (ATS), including CCAMLR.

### 3. Objectives and Principles of CCAMLR

The Preamble of CCAMLR emphasizes the importance of ensuring the conservation of Antarctic marine living resources [32]. Article II defines one objective of CCAMLR as conservation which includes “rational use” [33]. Fishing countries wanted the CCAMLR to concentrate on utilization with limited conservation measures, while non-fishing states called on the comprehensive preservation and protection of the Antarctic marine environment as a whole [34]. The introduction of the term “rational use” apparently represents the intention that the CCAMLR Commission desired to reconcile different interests between fishing and non-fishing countries [35]. The provisions of principles correspondingly attempted to make a compromise in terms of conservation standards between the two groups in exploitation and use [36]. Fishing states wished to introduce the concept of Maximum Sustainable Yield (MSY) that other RFMOs apply, whereas non-fishing states suggested that explicit conservation standards should be expressly defined in the provisions of Article II other than those revised by the Commission time by time [34]. However, paragraph 3 of Article II indicates a neutral position held by CCAMLR concerning conservation rules, which provides three principles, neither MSY or explicit conservation standards,

applying to all harvesting and associated activities in the CCAMLR Area [37]. In other words, CCAMLR does not prohibit harvesting of available marine resources but rather formulates a compromise between rational use and conservation [38]. It is well recognized that the neutral position of CCAMLR definitely contributed to its long-term success.

On the other hand, however, this neutral position, unfortunately, does not eliminate all disputes over the objectives and principles of CCAMLR. Relevant debates among ATCPs remain till now. Arguments over the objective concentrate on the characteristics of CCAMLR itself. It leads to the key question in theory of whether CCAMLR is a conservation-oriented regime or an RFMO. Justifiably speaking, the CCAMLR contains some provisions beyond those of traditional RFMOs, for instance, the International Whaling Commission (IWC). However, the position expressed by paragraph 2 of Article II shall be upheld as well.

Three principles set out in paragraph 3 are to be summarized as the ecosystem approach. As early as 1977, Recommendation IX-2 firstly underlined the importance to achieve an effective conservation of marine living resources in the Antarctic ecosystem as a whole [39]. This approach was recognized by most Contracting Parties during the negotiation of CCAMLR [40]. Rather than merely designating single species or certain marine areas under conservation, CCAMLR defines its Convention Area according to its indigenous resources, having taken into account species interaction and comprehensive preservation of the entire ecological system [41]. The CCAMLR Convention Area is described as following:

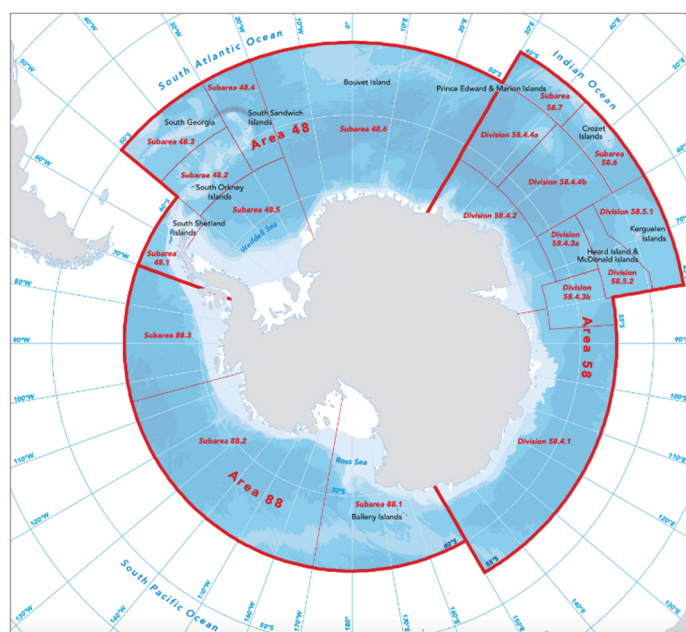


Figure 1. CCAMLR Area [42].

Therefore, CCAMLR was designed to including all living resources within the Convention Area but more so by the extent of their ecological wanderings [43]. It is fair to conclude that the ecosystem approach expressed in Article II sets CCAMLR apart from a typical fishery convention [36] (p. 229). While the interactions between species have been well considered, the interpretation of Article II is extremely complicated and challengeable to policymakers, however. It should be clarified that, distinct from the MSY normally adopted by the United Nations Convention on the Law of the Sea (UNCLOS) and other RFMOs, the ecosystem approach is an extraordinary innovation created by CCAMLR to conserve all renewable resources [44]. Given the nutrient level in the Antarctic marine ecosystem and other facts of the scientific complexities of fully understanding the interactive ecosystem, scientific information remains fundamental in implementing this approach.



The core of the ecosystem approach links closely with the precautionary approach/principle. Arguments over whether this term is an approach or principle have lasted for decades [45]. However, this concept has been incorporated by a number of international instruments, for instance, the Rio Declaration [46] and the Convention on Biological Diversity (CBD) [47]. Moreover, one thing is for sure: the burden of proof concerning the possible impact of a given activity under the precautionary approach/principle is reversed [48]. The precautionary approach/principle is an overall requirement for all activities engaged in the Antarctic, including the Southern Ocean. Accordingly, the burden of proof shall rest with people who are going to fish in the Southern Ocean, which means fishing states must prepare some environmental impact evaluations before fishing. Meanwhile, in order to better implement the ecosystem approach, the burden of proof shall rest with fishing states so as that prudence of scientific uncertainty supplies a true ecosystem approach in CCAMLR.

The scientific certainty can hardly be gained in the Antarctic, as scientists are still struggling to discover more and more facts about this mysterious region. The same is true of the ecosystem of the Southern Ocean. However, the scientific uncertainty shall not be the excuse of delaying the adoption of active conservation measures, as expressed by the precautionary approach/principle. By this logic, more adventurous measures could be carried out in data-poor areas. The measure of seasonal closure happens to be an appropriate choice in this regard and can perfectly fit into the precautionary approach/principle when scientific data are insufficient. Consequently, the seasonal closure is not only in accordance with but also to safeguard the objectives and principles of CCAMLR in a more proactive way.

In fact, the CCAMLR Commission is responsible to seek mutual understanding of objectives and principles through working out conservation measures over the past four decades, which also reflects the ATCPs' consensus of a step-by-step approach in developing the conservation regime of Antarctic marine living resources [40].

#### 4. Strengthening the Existing Conservation Measures

Current conservation measures in force, as mentioned above, divided into four categories by the Commission, are compliance, general fishery matters, fishery regulations, and protected areas [49]. The seasonal closure proposal tightly relates to the conservation measures of general fishery matters and fishery regulations, including CMs 31-01, 31-02, 32-01, 32-02, 32-09, and 32-18. CM 31-02 provides general rules for the closure of all fisheries in which vessels under the closure notice issued by the Secretariat of the Commission shall depart from closed areas and remove all fishing gear from water by the notified time [50]. The flag state bears main responsibilities in implementing this measure [48]. The fishing season for all CCAMLR Area species is from 1 December to 30 November of the following year (CM 32-01) [31]. Directed fishing on taxa in areas is prohibited (CM 32-02) [27]. According to CM 32-02, various kinds of finfishes [51] are not allowed to be harvested in Subareas 48.1 and 2 around the Antarctic Peninsula and South Orkney Islands [27]. In the Amundsen Sea (Subarea 88.3) and parts of the western Ross Sea [52], only toothfish shall be prohibited for directed fishing [27]. Toothfish and grey rockcod are non-harvested species near the Ob Bank and Lena Bank (Divisions 58.4.4 a and b) [27]. Patagonia toothfish is subject to prohibition around the Kerguelen Islands (Division 58.5.1), Heard and McDonald Islands (parts of Division 58.5.2 [53]), Crozet Islands (Subarea 58.6), and Prince Edward and Marion Islands (Subarea 58.7), adjacent to areas under national jurisdiction of coastal states [27]. Most of these prohibitions, however, are subject to the exception of scientific research permitted under CM 24-01 and the review by the WG-FSA on the basis of surveys of stock biomass so as to be amended by the Commission [27]. It should be noted that, in the South Georgia (Subarea 48.3), where the first conservation measure was adopted [54], the above two conditions cannot apply (*Electrona carlsbergi* not included), and the Commission can decide reopening based on the advice of the SC-CCAMLR [27]. The strict prohibition in South Georgia does not regulate any fishing of Patagonia toothfish, toothfish, and other

finfish [27]. Furthermore, directed fishing for toothfish in the Weddell Sea (Subarea 48.5) is prohibited [28]. In addition, in response to the FAO International Plan of Action for the Conservation and Management of Sharks, directed fishing on shark species for purposes other than scientific research is prohibited by the Commission [29]. Despite these measures, exploratory fisheries of toothfish, icefish, and krill are subject to the catch limits set out by the Commission [55]. By adopting the above conservation measures, the Commission essentially creates numbers of closed areas within the CCAMLR Area, mainly referring to CM 32-02. Similarly, toothfish fishing has been banned around the Weddell Sea by CM 32-09 annually since 2003, which probably has already turned into a closed area. As for sharks, the whole CCAMLR Area becomes de facto a closed area, or sanctuary, for sharks by CM 32-18.

The critical point is the MPAs regime created by the Commission. In 2002, CCAMLR committed to creating a network of MPAs following recommendations from the United Nations World Summit on Sustainable Development [56]. So far, there are two MPAs in the Southern Ocean established by the Commission, respectively, the South Orkney Islands southern shelf MPA (SOIMPA) and the Ross Sea Region MPA (RSRMPA). Three other MPAs are still under discussion and negotiation within CCAMLR [57]. The SOIMPA was created by the CM 91-03 in 2009, covering a 94,000-km square in Subarea 48.2 [58]. All fishing, discharges, dumping, and transshipment activities are prohibited within that area, with the exception for scientific fishing research activities under CM 24-01 [59]. SOIMPA is unprecedentedly pioneering in conserving marine biodiversity, although it leaves many gaps to fill in. However, the MPAs regime cannot and shall not exclude any rationale use of marine living resources in relevant areas [60]. Accordingly, by 2011, three principles of establishment of MPAs at least had been recognized by CCAMLR, and they are protection of the environment, freedom of scientific research, and rational use [59].

The following general framework for establishment of CCAMLR MPA adopted by CM 91-04 in 2011 is definitely a milestone in the proceeding of CCAMLR MPA. CM 91-04 connects the seasonal closure with closed areas, as it reads: “[D]esiring to implement Article IX.2(f) and 2(g) of the CCAMLR . . . ” [61]. This is the first time that the relationship between seasonal closures, closed areas, and MPAs has been clarified in CCAMLR’s legally binding documents. In 2016, The RSRMPA was agreed upon by CCAMLR and had been the largest MPA in the world since its establishment [62]. Three zones, each of which allows certain activities and restricts others, are divided in the RSRMPA [61]. CM 91-05 confirmed the relationship between seasonal closures (Article IX.2(f)), closed areas (Article IX.2(g)), and the MPAs regime. Overall, the RSRMPA is much more sophisticated than the SOIMPA, including different functional zones to achieve distinct purposes, respectively.

After a full consideration of Article IX.2 and relevant existing measures, some observations can be made. First, seasonal closure, as one form of conservation measures expressly provided by Article IX of CCAMLR, is a legitimate way to conserve relevant marine living resources. Any member has the right to propose a seasonal closure in accordance with provisions of CCAMLR. Second, there are some connections between seasonal closure, closed areas, and MPAs. In general, the CCAMLR Commission would endeavor to set up a seasonal closure in a certain area during a period of time, mainly focusing on one species, then extend the closing time of such seasonal closure so as to turn such closed season into a closed area, and finally seek possibilities to develop a MPA based on proper scientific evidence. Third, such relationship between seasonal closure, closed areas, and MPAs does not represent that seasonal closure is necessarily standing against the MPAs regime, and in fact, they could probably coexist and even mutually support each other for the conservation purpose.

Arguments always arise from the different roles that seasonal closures and MPAs play in the conservation of marine living resources in the Southern Ocean. Indeed, seasonal closures only refer to single-specie fishery, while the MPAs regime is an overall conservation of the whole ecosystem of the CCAMLR Area. The question is which one is better. It is hard to answer that comprehensively. Advocators of the MPA regime would claim that

the MPA regime could provide a more holistic and integrated measure in accordance with the ecosystem approach, whereas others would support seasonal closures as a pragmatic way to initiatively develop further conservation measures, if possible. On the other hand, it remains unknown which one could gain more support amongst CCAMLR members, as little discussion has occurred around the relationship between these two measures so far. Thus, it is necessary to conduct more research on this subject-matter in advance before more discussions happen in the future.

It is generally concluded that seasonal closure is in essence able to play as a bedstand to test whether the applied area should be transferred or upgraded to a closed area or turned into an MPA that includes seasonal closure and/or closed area. Adoption of seasonal closure would constantly bring out scientific understanding of certain aspects of the Antarctic ecosystem, which could be helpful to develop a more comprehensive and sophisticated regime to conserve fishery resources in the Southern Ocean. Besides, seasonal closure is also in conformity with the ecosystem approach, and such closure urges countries concerned to take actions before it is too late while no scientific certainty exists, as required by the precautionary approach. Overall, seasonal closure is a good way to strengthen existing measures under the CCAMLR, and it is feasible and reasonable to propose the seasonal closure in order to achieve the objective and principles of the CCAMLR, especially with consideration of SDG-14.

## 5. Consistency Test

According to the provisions of Article IX.5, conservation measures shall be consistent with any relevant measures, regulations, or recommendations made by the Antarctic Treaty Consultative Meetings (ATCMs) or by existing fisheries commissions. Two international treaties, the International Convention for the Regulation of Whaling (ICRW) and the Convention for the Conservation of Antarctic Seals (CCAS) [63], are specifically provided in Article VI. The consistency between the seasonal closure and other regulations could be divided into two categories. The internal consistency test is to examine whether such seasonal closure is consistent with regulations within the Antarctic Treaty System, while the external is to ensure this seasonal closure is in conformity with regimes outside the ATS.

### 5.1. Internal Consistency Test

#### 5.1.1. CCAS

The CCAS was adopted to fill the gap with regard to sealing outside of the regulation of the 1964 Agreed Measures for the Conservation of Antarctic Fauna and Flora (AMCAFF) [64]. The protected seal stocks expand to crabeater seals (*Lobodon carcinophagus*) and Weddell seals (*Leptonychotes weddelli*) [65]. The area that CCAS applies, which strictly adheres to the area south 60° S provided by Article VI of the Antarctic Treaty, is narrower than the CCAMLR Area [66]. Again, Article 3 of the CCAS provides that conservation measures under this Convention include opening and closing of sealing seasons [67]. The outstanding regime created by the CCAS is the “special permit” system which allows sealing countries to issue permits to kill or capture seals in limited quantities and in conformity with certain objectives and principles of CCAS [68]. The Annex of CCAS provides in detail permissible catch, protected species, closed season and sealing season, sealing zones, etc. Ross seals (*Ommatophoca*), Southern elephant seals (*Mirounga leonina*), and fur seals (*Arctocephalus*) are protected from sealing, and Weddell seals (*Leptonychotes weddelli*) are not allowed to be killed or captured during breeding time (1 September to 31 January inclusive) [69]. Sealing from 1 March to 31 August in the area south 60° S is forbidden [70]. The provisions of the Annex could be amended by Contracting Parties in accordance with Article 9 of the CCAS.

Given the arrangements stipulated by CCAS, it is well accepted that CCAS is a typical RFMO targeting one single species and is slightly distinct from CCAMLR. In fact, since the enforcement of the CCAS, large-scale sealing has never occurred in the Antarctic [71].

There is currently no market need for seals, either [72]. Suspension of commercial sealing, as Julia Jabour viewed, is more a sort of response to public emotions than a practical effort before [71] (p. 11). In 2002, the number of seals in the South Georgia only reached three million [73].

However, for the purpose of keeping internal consistency, the seasonal closure under the CCAMLR should not derogate any measures adopted by the CCAS. Such seasonal closure should not deal with any sealing activities, although sealing in the Antarctic is not in the ambit of international discussion anymore [74]. Frankly speaking, due to the clear nutrient level of the Antarctic ecosystem and that the seal is one of the top predators in the Southern Ocean, it is probable to indirectly manage and conserve seals through seasonal closures over krill, toothfish, and icefish. Accordingly, there is no problem to propose seasonal closures targeting zooplanktons and fishes in the Southern Ocean only if such measures would not mandate sealing.

#### 5.1.2. The Madrid Protocol

The 1991 Protocol on Environmental Protection to the Antarctic Treaty (the Madrid Protocol) is a milestone in the international management of Antarctica and widely for the global environment by the creation of an integrated environmental protection regime [75]. Regimes relating to the seasonal closure are provided by Annexes II and V to the Madrid Protocol, both of which derive from the AMCAFF. Obviously, conservation of Antarctic marine living resources constitutes part of the comprehensive environmental protection regime [76].

Annex II was amended by Measure 16 (2009) during ATCM XXXII [77]. This amended version of Annex II is mainly to protect native fauna and flora [78]. However, zooplankton or fish is not within the ambit of Annex II [79], although native mammal is subject to Annex II, not jeopardizing provisions of ICRW [80]. Conservation of marine mammal might still be under the long-term regulation of the IWC, and thus, seasonal closures over krill and two kinds of fishes would not be in conflict with Annex II to the Madrid Protocol.

According to Annex V, two relevant arrangements developed by the ATCMs have to be taken into full account, namely Antarctic Specially Protected Areas (ASPAs) and Antarctic Specially Managed Areas (ASMAs). ASPAs refer to areas, whether marine or terrestrial, where outstanding environmental, scientific, historic, aesthetic, or wilderness values, any combination of those values, or ongoing or planned scientific research shall be well protected [81]. ASPAs include Specially Protected Areas and Sites of Special Scientific Interest designated by past ATCMs [82]. Any entry into ASPAs shall be prohibited, with exceptions provided by Article 7 of Annex V [83]. It is not difficult to find that fishing vessels are not allowed to sail into any ASPAs, which means seasonal measures shall not apply in marine areas that have been designated as ASPAs. The other one, ASMAs, include marine areas in which activities are being conducted or are to be conducted to assist in the planning and co-ordination of activities, avoid possible conflicts, improve co-operation between Parties, or minimize environmental impacts [84]. The purpose of ASMAs is to avoid risks of mutual interference or cumulative environmental impacts caused by relevant activities and protect sites or monuments of recognized historic value [85]. However, fishing vessels do not need a permit to entry into ASMAs [86]. Therefore, seasonal measures can be conducted in ASMAs. However, the size of each ASPA or ASMA is quite small, especially compared with closed areas or MPAs [87], and the influence from ASPAs and ASMAs towards determination of seasonal measures therefore seems minor.

### 5.2. External Consistency Test

#### 5.2.1. Whale Sanctuary

Whale Sanctuaries are developed by the IWC in accordance with the provisions of the ICRW in order to conserve the whale stocks. The first IWC whaling sanctuary, the Indian Ocean Sanctuary (IOS), was established in 1979 [88]. The Southern Ocean Sanctuary (SOS) was designated by the IWC in 1994, approximately covering the waters of the



Southern Ocean [88]. Commercial whaling is prohibited in the SOS as illustrated below (see Figure 2).

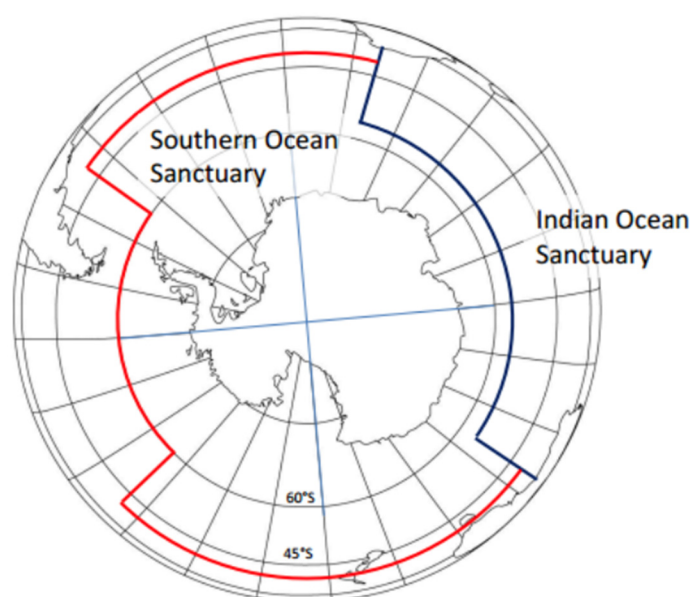


Figure 2. Southern Ocean Sanctuary [89].

Three principles have been highlighted by the IWC. First, scientific reasons to designate such sanctuary must be definite and clear. Second, temporary functional duplications caused by the sanctuary cannot undermine the validity of long-term scientific and conservative values. Third, the precautionary principle will be applied if there is no consensus with regard to certain affairs of the sanctuary [90]. Legal effects and outcomes of the SOS have been further demonstrated by the International Court of Justice in the *Whaling in the Antarctic (Australia v. Japan: New Zealand intervening)* Case in which the Court found that Japan has not acted in conformity with its obligations under the SOS in pursuance of Phrase II of Japanese Whale Research Program under Special Permit in the Antarctic (JARPA II) [91].

As discussed above, even though all marine living resources are under the regulation of CCAMLR, the Convention shall not derogate from the rights and obligations of the Contracting Parties under the ICRW [92]. Whales, therefore, cannot be the targeted species directly managed by conservation measures of the Commission in the Convention Area. The nutrient level within the Antarctic ecosystem, however, determines that the conservation of whales, heavily relying upon krill, is not possibly unaffected by the conservation of krill, which is one of the main targeted species of CCAMLR. It is paradoxical that single-species conservation and comprehensive preservation of the marine ecosystem shall be maintained simultaneously in the Antarctic, and, as Erik Molenaar argued, understanding the functional relationship between target species and non-targeted species might be one of the biggest challenges for conservation and management of CCAMLR [93].

Thus, according to the provisions of Articles I, VI, and IX.5, the seasonal closure in the Southern Ocean shall not be inconsistent with the regulations adopted by the IWC, primarily the SOS. In other words, such seasonal closure cannot directly mandate conservation of whales in the Convention Area, whereas it is entitled for CCAMLR to regulate other species, such as krill, toothfish, or icefish, the conservation of which is closely related to the conservation of whales.

### 5.2.2. Voluntary Restricted Zones (VRZs)

Another notable regime relating to the seasonal closure is the Voluntary Restricted Zones (VRZs) proposed by the Association of Responsible Krill-Harvesting Companies

(ARK) and other NGOs [94]. The VRZs represent the main conservation effort from ARK companies to protect critical habitat for krill-dependent predators, mainly penguins, during the summer season [94]. The implementation of this voluntary restriction on fishing is as follows:

1. Antarctic Peninsula will be closed to krill fishing (40 km buffer) between 1 October and 1 February;
2. Gerlache Strait will be closed to krill fishing (30 km buffer) between 15 October and 15 February;
3. South Shetland Islands will be closed to krill fishing (40 km buffer) between 1 November and 1 March [94].

The VRZs are outside of CCAMLR and some members, such as Australia and the UK, probably prefer to consider such issues under the MPAs regime. Besides, the VRZs partially overlap with the proposed D1MPA jointly submitted by Chile and Argentina. The true deficiency of the VRZs is that this regime is developed by industries that governments seldom submit themselves to. Additionally, the VRZs are not legally binding. The foundation of such voluntary action is different with any conservation measures proposed by state parties based on state commitments. However, this effort might partly contribute to the formulation of the seasonal closure initiated by states in terms of seasonally closing krill fishing. Furthermore, problems of the VRZs might remind policymakers to develop a seasonal closure subject to discretions of CCAMLR in form of conservation measures.

#### 5.2.3. Agreement on the Conservation of Albatrosses and Petrels (ACAP)

Another relevant issue is the Agreement on the Conservation of Albatrosses and Petrels (ACAP). The ACAP [95] is to conserve listed albatrosses, petrels, and shearwaters by coordinating international activities to mitigate known threats to their populations [96]. Incidental mortality of birds resulting from interactions with fishing gear is one of the most significant threats facing albatrosses and petrels, which is also regulated by relevant conservation measures adopted by the Commission, including CMs 25-02 and 25-03 [97]. According to the Memorandum of Understanding (MOU) between the CCAMLR Commission and the ACAP Secretariat, which was signed on 1 November 2018, these two bodies are committed to facilitate cooperation in supporting efforts to minimize the incidental by-catch of listed albatrosses and petrels in the CCAMLR Area [98].

There is no doubt that the conservation of birds promoted by the ACAP is directly related to conservation measures adopted by the CCAMLR Commission in which the removal of certain fishing gear does inevitably result in the prohibition of fishing during some periods of time during each fishing season. However, efforts made by the ACAP do not diminish the necessity of proposing seasonal closures under CCAMLR in the Southern Ocean. On the contrary, the common interest to conserve albatrosses and petrels implicitly represents the urgency to conduct seasonal closures. In order to better minimize incidental mortality of birds, the fishing activities concerned should be forbidden in the form of seasonal closures in the Southern Ocean, which is obviously a stronger measure than mere removal of fishing gear.

Accordingly, proposed seasonal closure can probably target krill, toothfish, or icefish, which are allowed to be fished in the marine areas except the areas of special protection, such as ASPAs, ASMAs, and MPAs. IWC sanctuaries can also be the area where seasonal closure applies. To avoid unnecessary duplication in the management and conservation of fishery resources, it is not feasible to adopt seasonal closures in existing MPAs or VRZs. As for the chosen period of time, the breeding time seems a better choice. After all, details of all these conditions shall be finally determined by the standard of best scientific evidence available, but such standard will not prevent the policy-making process from being formulated by CCAMLR, as demonstrated by past experiences of the adoption of most conservation measures.

## 6. Further Considerations

After examining the legal applicability of the seasonal closure in the Southern Ocean, the next question concerns why it is a wise choice for China to jointly propose such seasonal closure. Any strategy is basically rooted in state interests as well as the status quo of state practice in that regard. On the surface, the true intention of China's proactive participation into Antarctic affairs is not so clear at least in comparison with many traditional Antarctic countries. Rapid growth of capacity to explore and exploit Antarctic resources undoubtedly results in enhancing its role in Antarctic governance. However, misunderstandings have risen from this shift in which traditional Antarctic countries (original signatory states in 1959) will definitely be concerned about wider participation of newly involved Antarctic countries (acceding states after 1959). Adherence to existing rules in Antarctic governance, primarily the ATS, may be the wisest choice for making contributions to good governance of Antarctica. In terms of CCAMLR, any constructive proposals, whether concerning seasonal closures, closed areas, or MPAs, can be beneficial with mutual understanding between old members and newcomers.

China is a member of the CCAMLR Commission and has been engaged in the conservation of fishery resources for decades. From the perspective of capacity, China has advanced marine scientific technologies and excellent scientists and conducted many marine research expeditions both individually or jointly. In addition, China is an important DWF state with large-scale fishing fleets. Additionally, in 2020/21 season, six Chinese fishing vessels for krill were notified to the Commission in the CCAMLR Area [99].

In terms of geopolitical considerations in Antarctic governance, several basic conflicts or tensions must be carefully kept in mind. Conflicts between claimant states and non-claimant states [100], between fishing states and non-fishing states, and between traditional Antarctic countries and newly involved Antarctic states. Notably, tensions between claimant states and non-claimant states have recently concentrated on the MPAs regime, particularly the East Antarctic MPA and D1MPA that were proposed by claimant states (Australia, Chile, and Argentina). It is unacceptable to connect the establishment of MPAs to claims of maritime zones claimant states. Since the MPAs issue is highly political and hardly to facilitate agreements between CCAMLR members in the near future, the seasonal closure might be a pathway to engage some essential cooperation between those members.

## 7. Conclusions

China has its discretion and rights to submit a joint seasonal closure proposal within the framework of CCAMLR. Such seasonal closure shall be required to be subject to the objectives and principles of CCAMLR and adherent to conservation, including a rational use and an ecosystem approach based on the precautionary approach/principle. The seasonal closure could be adopted with no scientific certainty in the context of the precautionary approach/principle. More importantly, seasonal closure is not necessarily in conflict with the establishment of MPAs, and in some ways, these two will mutually supplement each other. In order to fulfill the consistency test, such seasonal closure shall not be inconsistent with other measures, regulations, or regimes, such as CCAS, ASMAs, ASPAs, IWC Sanctuary, VRZs, or ACAP.

The wider involvement of China into Antarctic affairs cannot be ignored. Though it seems too early to consider China as a big power in Antarctic governance given its late participation, China is rising rapidly, especially in science, fisheries, and tourism [101]. The rise of China is a fact and causes considerable concern of some Western countries. When the active attitude behind the seasonal closure was conducted by the Chinese government, it was a surprising signal of China's willingness to make progressive and constructive contributions to the global ocean governance; many countries are not happy with China in this respect.

Nevertheless, nothing will stop China from repeatedly pursuing any means to protect the Antarctic environment and conserve Antarctic marine living resources. The conservation, including rational use, is always the main objective of the management of Antarctic

marine living resources. It is completely legitimate for members to propose a seasonal closure with specific targeted species, certain marine areas, and durations of time. Therefore, the analytical finding in this paper indicates that seasonal closures are a viable and sound proposal to achieve the objectives and principles of the CCAMLR and the furtherance of good governance for Antarctic marine living resources.

However, it should be noted that the final purpose of seasonal closure is not only the concern of the CCAMLR, but also of any other suitable RFMOs. The seasonal closure in CCAMLR, once established, should inspire and facilitate the introduction of such seasonal closure into other RFMOs. In doing so, the seasonal closure could eventually contribute to the SDG-14 in the long run.

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