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**Domain 1 Marine Protected Area Preliminary Proposal PART A-2:  
MPA Model**

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Delegations of Argentina and Chile



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# Domain 1 Marine Protected Area Preliminary Proposal

## PART A-2: MPA Model

### Delegations of Argentina and Chile

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#### **Abstract:**

This document contributes to the planning process for the designation of a Domain 1 MPA led by Argentina and Chile. Specifically, this paper describes the rationale behind the development of the Domain 1 MPA model, which was based on the identification of Priority Areas for Conservation (PAC, WG-EMM-17/23, SC-CCAMLR XXXVI/XX) and considerations of krill fishery management and climate change, which was introduced and discussed during WG-EMM 2017.

Given the complexity of Domain 1 and the large number of human activities in the region including research, fishing activities and tourism, the creation of a multinational Expert Group was proposed during WG-EMM-17 (WG-EMM-17, paragraph 4.2). This could constitute an appropriate mechanism to further discuss the Domain 1 MPA model, as well as the most adequate Research and Monitoring Plan, in order to achieve a management that ensures protection while allowing rational use of the resources, thus, in accordance with the Objectives of the Convention (WG-EMM-17/23, SC-CAMLR XXXVI/XX).

Within the multinational approach undertaken so far, Argentina and Chile invite Members and Observers to consider the preliminary Domain 1 MPA model and encourage them to participate in future work towards the designation of a CCAMLR Domain 1 MPA through the Expert Group or other agreed mechanisms.

Domain 1 Marine Protected Area Preliminary Proposal.

PART A-2: MPA MODEL

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## **BACKGROUND**

1- The main objective for establishing a system of Marine Protected Areas (MPA) in the Southern oceans is to preserve marine biodiversity, which can only be achieved by maintaining a healthy ecosystem in the Convention Area. Indeed, MPAs aim to contribute to sustaining ecosystem structure and function, including areas outside the MPAs. Further, conserving the unique Antarctic biological biodiversity will, in turn, contribute to food security.

2- One of the most productive areas of the Southern oceans is the Southwest Atlantic sector, from the Antarctic Peninsula to the Antarctic Convergence and Scotia Arc, including the South Georgia and South Sandwich Islands. In fact, about 75% of the circumpolar krill population is located in this area. Because of the characteristics of the coastal regions of the Antarctic Peninsula, the complex coastal circulation may serve to retain and transport plankton within the coastal region. In this area, during the austral summer and autumn, large aggregations of birds and krill-feeding whales have been observed.

3- The West Antarctic Peninsula (WAP) is subject to on-going environmental changes; changes in the extension and duration of sea ice, temperature increase, ice shelves collapse, ocean acidification and changes in the wind regime. In particular, the North-South oriented WAP presents a strong latitudinal climate gradient both in temperature and sea ice, characterized by a shorter ice season and more maritime conditions in the North, and a longer ice season and more continental conditions in the South.

4- Krill fishery activity began in 1961 but it became more intense by the 1970s. After an exploratory period, since the early 1990s it is focussed almost entirely in the Atlantic Ocean sector. In the past 10 years and most likely due to the decrease of sea ice extension, the spatial distribution of the fishery has been moving to the South, where nowadays it is mainly concentrated in i) the region of the Bransfield Strait/Mar de la Flota, ii) the Northwest of Coronation Island, and iii) the north of South Georgias Islands (CCAMLR Krill Fishery Report 2015).

5- Because of the increasing variability of the environment recorded in the area and the increasing capability of the fisheries, the interest in harvesting activities is growing. Thus, there is a need for a multinational research effort aimed to understand the on-going processes in the region. Climate change is one of the main factors affecting the Antarctic marine ecosystem, imposing a new set of pressures that will affect productivity, species distribution and ecosystem processes. These changes are currently more prevalent on the WAP, but may threaten the rest of the Antarctic in the future. Thus, there is an urgent need to incorporate climate change into the management of fisheries, in order to help to understand and disentangle the effects of the different drivers. A rigorous understanding of the different factors driving changes in Antarctica will improve our ability to detect and adapt to future changes, hence helping to minimize the disruption of marine ecosystems and human food supplies.

6- Since 2005, CCAMLR has been working on the development of Marine Protected Areas, in accordance with Articles II and IX of the Convention. The development of a system of protected areas was required in order to assist CCAMLR in achieving its broader conservation objectives, obtaining scientific knowledge at a broad-scale – bioregionalisation - and also at a fine-scale -subdivision. Later on, in 2010, to further preserve the significant marine biodiversity of the Convention Area, the Commission endorsed the Scientific Committee's work program to develop a representative system of Antarctic MPA. In 2011, eleven priority areas were identified, and then reviewed and re-scaled into nine large-scale MPA planning domains, to better reflect the scale and location of current and planned research effort, considered to

be more helpful at monitoring units. Later that year, Conservation Measure 91-04 (2011) was adopted, providing a general framework for the establishment of CCAMLR MPAs, including overarching MPA objectives, key elements and limitations of MPA conservation measures, and requirements for management, and research and monitoring plans.

7- Marine ecosystems that surround the Antarctic have similarities but also have unique characteristics of different areas, both in several aspects of their ecology and in the potential threats they might face. A network of MPA that cover an ecological gradients and different environmental characteristics will help protecting the Antarctic, as well as enhancing its resilience for the future. For this reason, individual MPA should complement each other based on the differential conservation objectives and threats present in each of CCAMLR's Planning Domains.

8- Domain 1 MPA planning process consisted in a comprehensive compilation and integrative analysis of a significant amount of information through a multinational approach in all stages of the decision making process towards identifying Priority Areas for Conservation (PAC) in Domain 1. After two international workshops (in 2012 and 2015) and an informal workshop (in 2016), and based on 143 spatial data layers, a series of Priority Areas for Conservation were proposed and introduced for discussion during the WG-EMM-2017. Based on the uniqueness of their morphology, geology, climate, flora and fauna, as well as considering current management strategies, Domain 1 was thought in terms of three ecoregions (Northwestern and Southwestern Antarctic Peninsula and South Orkney Islands; WG-EMM-17/23, SC-CCAMLR-XXXVI/XX).

9- The preliminary Domain 1 MPA Model includes important marine areas of the Antarctic Peninsula and South Orkney region that contribute to achieving the following objectives:

- i) To protect a representative portion of benthic and pelagic marine environments;
- ii) To protect large-scale benthic and pelagic ecosystem processes, that contribute to preserve predictable high sources of productivity,
- iii) To protect important (spatially constrained/predictable) areas for zooplankton life cycles, including Antarctic krill (*Euphausia superba*) nurseries;
- iv) To protect important (spatially constrained/predictable) areas for fish life cycles, with particular emphasis in commercially overexploited species in the past;
- v) To protect the distribution of marine mammals and birds during critical stages of their life-history;
- vi) To protect known rare or vulnerable benthic habitats; and
- vii) To establish scientific reference areas to help understanding the potential effect of fishery activities and/or climate change on the Antarctic marine ecosystem, as well as to generate research synergies between national programs, research fishery, in order to develop a multinational research and monitoring plan.

10- This preliminary proposal will preserve important areas for iconic Antarctic species such as Emperor penguins (*Aptenodytes forsteri*) and Adélie penguins (*Pygoscelis adeliae*), both of which show a decreasing trend in their population in the WAP. Also, it will protect Antarctic krill nurseries which include vulnerable stages of their life cycle, and occurrence areas for exploited fish. In the region of Marguerite Bay, important benthic and pelagic bioregions are protected, such as canyons and cross shelf valleys, and polynyas margins which are important areas for birds and mammals such as those of the non-breeding foraging distribution of killer whales (*Orcinus orca*) type B1. The North West Antarctic Peninsula (NWAP) is an area of high

biodiversity and concentration of large population of birds and mammals, during both breeding and non-breeding periods. It also protects important areas for fish life cycles such as spawning/early stages habitats and occurrence areas for exploited species; and important areas for zooplankton life cycles, including the Gerlache and Weddell krill nurseries. In the South Orkney region, high protection is also given to important areas for birds and mammals, including breeding foraging distribution of pygoscelid penguins, and important areas for zooplankton life cycles, including the SOI krill nursery.

11- Regarding krill fishery activities, we recognized the Domain 1 MPA preliminary proposal includes current and potential fishing grounds for the krill fishery and, as such, it requires special attention. As mentioned in paper WG-EMM-17/23, although a krill fishing cost layer was not included in the Marxan analysis, due to the complexity of spatial and temporal patterns observed in this fishery (WG-EMM-17/22), we recognize the importance of including krill fishery distribution in the planning of Domain 1 MPA in later stages of the process.

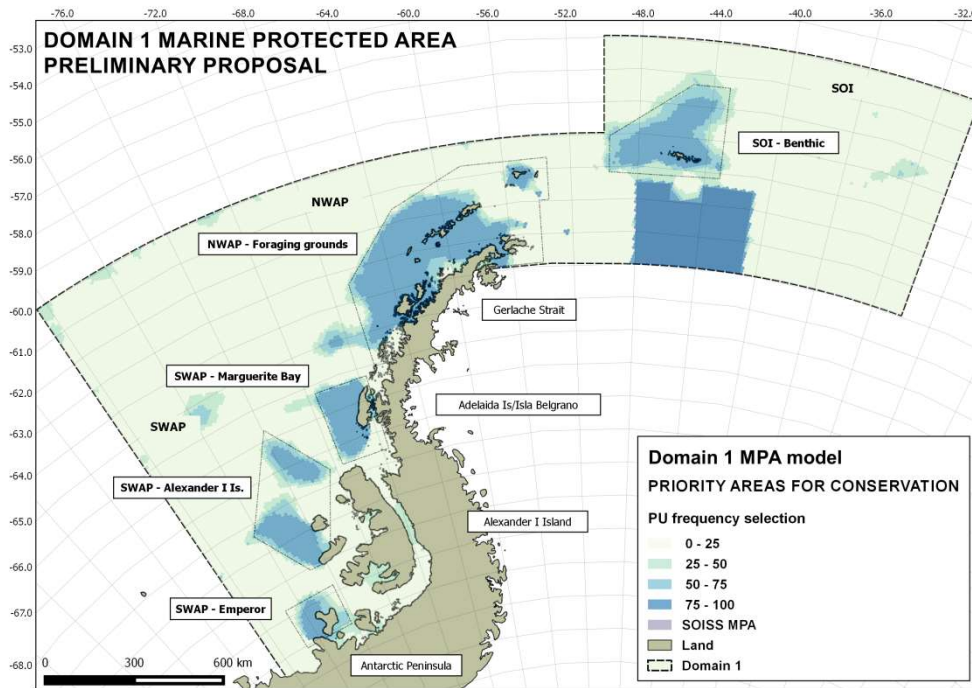
12- Fishery Management of the MPA: Krill fishing in Domain 1 will be managed as agreed by the Commission in a manner consistent with the objectives of the Convention. In Domain 1 other management activities pertinent to this region are currently in the process of being developed, such as work on risk analysis for the krill fishery and Feedback Management Strategy (FBM) (SC- CCAMLR-XXXV, para. 5.8). Consequently, at this stage of the proposal we are not defining or proposing a particular management strategy, in line with the need to integrate existing and proposed management approaches for Domain 1, as recognised by the WG-EMM-17 (WG-EMM-17, para. 4.16). Given the complexity of this decision, which has been a subject of discussions within CCAMLR for the last years, we propose to work on this integrated approach within the framework of an Expert Group (WG-EMM-17/23, SC-CCAMLR-XXXVI/XX).

## **DOMAIN 1 MPA MODEL**

Priority Areas for Conservation (PAC) were identified for Domain 1 (WG-EMM-17/23, SC-CCAMLR-XXXVI/XX) where complex, numerous and spatial-variable features overlap. Identified PAC include three ecoregions – Northwest and Southwest Antarctic Peninsula (NWAP and SWAP) and South Orkney Islands (SOI) - that differ not only in their morphology, geology and ecology, but also in their current management and resilience to climate change.

Although these PAC captured spatial features based on their established conservation targets, it is generally complicated to protect all the areas identified by Marxan, even more so when the distribution of spatial features is complex. The process then requires the design of models that are based on the results of Marxan but incorporate other relevant information, such as fishery management and climate change.

In this regard, the Domain 1 MPA model (Fig. 1) identified three areas in SWAP (Emperor, Alexander I Is. and Marguerite Bay), one in NWAP (Foraging Grounds) and one in SOI (Benthic).



**Figure 1:** Domain 1 MPA model in relation to the priority areas for conservation. Three zones are identified in SWAP, and one in both NWAP and SOI.

A detailed analysis by zone was performed to identify which conservation objectives are covered by each zone (Fig. 1, and see WG-EMM-17/25 Rev. 1 and SC-CCAMLR-XXXVI/XX). Below, we provide a summary with the main results.

*South West Antarctic Peninsula (SWAP): composed by 3 zones*

**SWAP-EMPEROR** - It covers approximately 21000 sq km and mainly protects the emperor colony located at Smiley Island and important benthic habitats located at the Antarctic Peninsula shelf. Over 50% of the targets are also met for several pelagic bioregions and large-scale pelagic ecosystem processes such as polynyas and sea ice extension during summer (Fig 3 in WG-EMM-17/25 rev. 1)

**SWAP-ALEXANDER I IS** - It covers approximately 82000 sq km and mainly protects several important benthic habitats, almost 40% of the important pelagic bioregions, large-scale pelagic ecosystem processes such as southern parts of the Antarctic Circumpolar Current front, important areas for the life cycles of fishes and krill by protecting occurrence areas for exploited fish species and krill nurseries in the Bellingshausen region, respectively (Fig. 4 in WG-EMM-17/25 rev. 1)

**SWAP-MARGUERITE BAY** - It covers approximately 38000 sq km and mainly protects few benthic (canyons and cross shelf valleys) and pelagic bioregions (polynyas margins and shallow shelf areas); important areas for birds and mammals, particularly associated with breeding foraging distribution of Adélie penguin; parts of the distribution of crystal krill and over 50% of the non-breeding foraging distribution of killer whales type B1; spawning/early stages habitat fishes are also protected at some extent (Fig. 5 in WG-EMM-17/25 rev. 1).

*North West Antarctic Peninsula (NWAP):*

**NWAP-FORAGING GROUNDS** - It covers approximately 215000 sq km and comprises the protection of a large quantity of conservation objects but it is mainly characterized by covering

important areas for birds and mammals, including breeding foraging distribution of fur seals, and Adélie, chinstrap (*P. antarctica*) and Gentoo (*P. papua*) penguins; and non-breeding foraging distribution of humpback (*Megaptera novaeangliae*), minke (*Balaenoptera acutorostrata*) and killer whales (types A, B1 and B2), and Weddell and leopard seals (Fig. 6 in WG-EMM-17/25 Rev. 1). It also protects important areas for fish life cycles such as spawning/early stages habitat and occurrence areas for exploited species; and important areas for zooplankton life cycles, including the Gerlache and Weddell krill nurseries and the section of the Circumpolar Deep Water located in the Bransfield Strait / Mar de la Flota (Fig. 6 in WG-EMM-17/25 Rev. 1), projected nursery areas by 2030 in Palmer Deep (see SC-CCAMLR-XXXVI-XX); also echinoderm communities and diverse benthic environment types; Polynyas margins; Shelf incising canyon and part of the seamounts.

#### *South Orkney Islands region (SOI)*

**SOI-BENTHIC** - It covers approximately 90000 sq km and mainly protects important benthic areas, with near 40% of them covered in at least 50% of their target (Fig. 7 in WG-EMM-17/25 Rev. 1). High protection is also given to important areas for birds and mammals including breeding foraging distribution of pygoscelid penguins, and important areas for zooplankton life cycles including the SOI krill nursery (Fig. 7 in WG-EMM-17/25 Rev. 1). Also, areas associated with ACCF; sponge communities and most seamounts located in depths lower than 2,000 meters.

**SOISS MPA** - It covers approximately 94000 sq km and mainly protects important benthic habitats including the plateau, the plateau slope at different depths; seamounts > 2000m and seamount ridge (Fig. 8 in WG-EMM-17/25 Rev. 1) and sponge communities; two pelagic bioregions and non-breeding foraging distribution of Adélie penguins are also captured by this area.

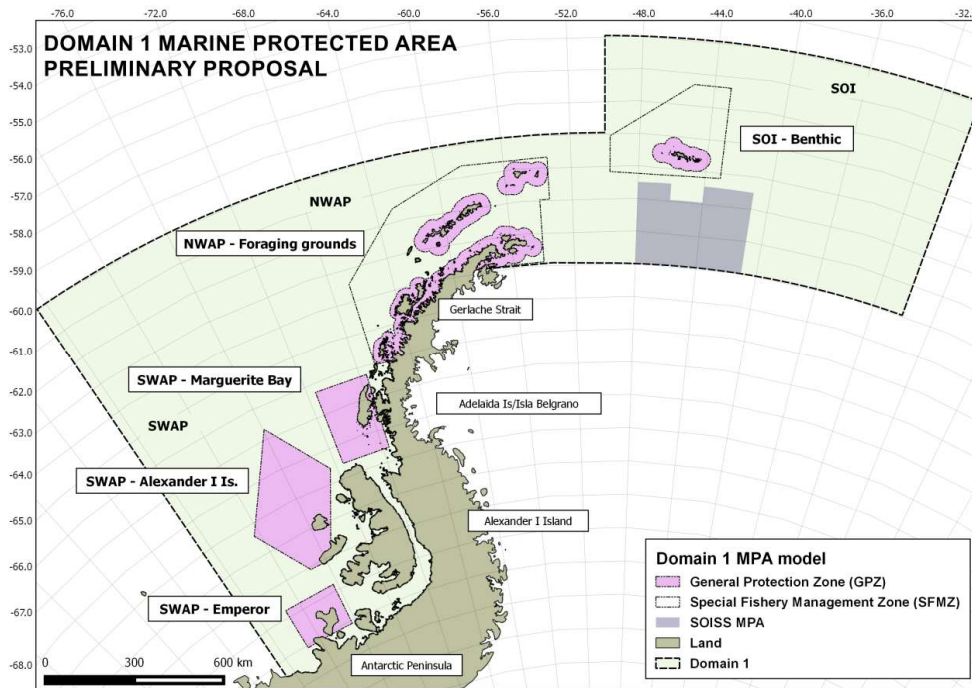
### DOMAIN 1 MPA MANAGEMENT

The three ecoregions identified in Domain 1 - SWAP, NWAP and SOI - differ not only in their ecology, but also in their current management and resilience to climate change.

In this sense, the proposed MPA model has different management components (Fig.2):

- 1) General Protection Zones (GPZ): where only research fishery is allowed.
- 2) Special Fishery Management zones (SFMZ): where commercial fishery is allowed.





**Figure 2.** Domain 1 MPA model including management components. SWAP is composed of three GPZ, and NWAP and SWAP have both components GPZ and SFMZ.

*South West Antarctic Peninsula (SWAP): managed as General Protection Zone*

**GPZ- Emperor, GPZ-Alexander I Is., and GPZ-Marguerite Bay:** These zones would be managed as General Protection Zones, in which only research fishing would be allowed.

**NWAP-Foraging grounds:** managed as General Protection Zone and Special Fishery Management Zone

- GPZ-Foraging grounds: given by a 30 km buffer around the Antarctic Peninsula and South Shetland Islands, where only research fishing will be allowed.\*
- SFMZ-Foraging grounds: where commercial krill fishery will be allowed as agreed by the Commission in a manner consistent with the objectives of the Convention.

\*By including the 30 km buffer zone from the coast, we protect the foraging areas of predators during summer, among other aims (see Fig. 9 in WG-EMM-17/25 rev. 1). Note that Adélie foraging areas during incubation and fur seals during summer will use a larger habitat than 30 km (Hinke et al. 2017). We also protect the early stages of fish (larvae/young juveniles) that may be taken as by catch by krill trawlers (as in CM 1/III). We have considered the idea of establishing the 30 km buffer zone only during the predators breeding period (October-March). However, given that the spawning period of most of the coastal Antarctic fish (notothenioids) includes autumn-winter months, that the non-breeding season of whales could varied up to July (Weinstein et al. 2017) and that the seabirds breeding period/season is between October and March, we proposed that the General Protection Zone should apply all year-round.

**SOI-Benthic:** managed as General Protection Zone and Special Fishery Management Zone

- GPZ-Benthic: given by a 30 km buffer around the South Orkney Islands, where only research fishing will be allowed.\*

- SFMZ-Benthic: commercial krill fishery will be allowed as agreed by the Commission in a manner consistent with the objectives of the Convention.

\*By including the 30 km buffer zone from the coast, we protect the foraging areas of predators during summer, among other aims (see Fig. 10 in WG-EMM-17/25 rev. 1). We also protect the early stages of fish (larvae/young juveniles) that may be taken as by catch by krill trawlers (as in CM 1/III). We have considered the idea of establishing the 30 km buffer zone only during the predators breeding period (October-March). However, given that the spawning period of most of the coastal Antarctic fish (notothenioids) includes autumn-winter months, and that the seabirds breeding period/season is between October and March, the General Protection Zone should apply all year-round.

**SOI SS AMP:** Management to be conducted in accordance with CCAMLR CM91-03.

### Domain 1 MPA Model– Area and Boundaries

The Domain 1 MPA model covers an area of approximately 450000 sq km which is distributed across bioregions in approximately 32% in SWAP, 48% in NWAP and 20% in SOI.

Management zones represent approximately similar areas accounting each for about 50% of total MPA. General Protection Zone in NWAP-Foraging grounds and SOI-Benthic roughly accounts for 20%.

The selection of final boundaries for each zone was done carefully based on geographic features and clear lat/long vertices to improve MPA implementation. Details on boundaries are provided in Annex 1.

**Table1:** Sizes of Domain 1 MPA preliminary proposal, discriminated by management component and by zone. Total Domain 1 extension is also included.

Bioregion	Zones	Management	Area approx (km2)
SWAP	SWAP – Emperor	GPZ – Emperor	20959
SWAP	SWAP – Alexander I Is.	GPZ – Alexander I Is.	82356
SWAP	SWAP – Marguerite Bay	GPZ – Marguerite Bay	38389
NWAP	NWAP – Foraging grounds	GPZ – Foraging grounds	76470
		SFMZ – Foraging grounds	138757
SOI	SOI – Benthic	GPZ – Benthic	13419
		SFMZ – Benthic	76795
<b>TOTAL DOMAIN 1 MPA PRELIMINARY PROPOSAL</b>			<b>447145</b>

### FISHERY

Domain 1 MPA preliminary proposal includes current and potential fishing grounds for the krill fishery and, as such, it requires special attention. As mentioned before, although a krill fishing cost layer was not included in the Marxan analysis, due to the complexity of spatial and temporal patterns observed in this fishery, we recognize the importance of including krill fishery distribution in the planning of Domain MPA in later stages of the process.

In 2016, it was noted that the Domain 1 spatial planning activity overlaps with the development of other management activities pertinent to this region, such as work on risk analysis for the krill fishery and on Feedback Management Strategy (FBM) (SC- CCAMLR-XXXV, para. 5.8). Krill fishing in Domain 1 will be managed as agreed by the Commission in a manner consistent with the objectives of the Convention which may include current CM 51-07 and future strategies as the FBM. Priority areas for conservation identified in this proposal could assist in the development of such strategies by focusing resources. Moreover, data included in Domain 1 MPA process could also serve as baseline information for future strategies. In this regard, WG-EMM has requested the advice from the Scientific Committee in order to consider a strategy for integrating existing and proposed management approaches for Domain 1 (WG-EMM-17, para. 4.16).

### **FISHERY MANAGEMENT OPTIONS – A FEW EXAMPLES**

In order to harmonize the MPA process with current and future Management Strategies, we provide a brief list of possible strategies that could be considered for the NWAP-Foraging grounds and SOI-Benthic.

#### **NWAP- Subarea 48.1**

- 1- Risk assessment (WG-FSA-16/47 Rev. 1 and WG-FSA-16/48)
- 2- Changes in the starting day of the fishery period (WG-EMM-16/16)
- 3- Coastal buffers (SC-CCAMLR XXXV-BG/14)
- 4- Reference areas\*: as the priorities areas for conservation match with the SSMU, we suggest alternating the SSMU using ten-year periods to evaluate the effect of fishery. A ten-year period is proposed, as it would allow us to detect trends in predators' populations, as well as including prey life cycle (krill life cycles of 5 or 8 years). Eventually, after the first 20 years, the periods could be reduced to 5 years. Reference Areas will allow us to evaluate effects caused by either environmental variability or potential negative effects produced by fisheries, especially in areas close to the coastal zone.

\***Baseline:** CEMP Sites; breeding and post breeding dispersal; krill surveys; research surveys for *Dissostichus* spp., and all data is available on the Domain 1 e-group. As suggested in SC-CAMLR-2016 paragraph 5.8, datasets made available by the Domain 1 planning group could be used to support work in these areas.

#### **SOI- Subarea 48.2**

1. Possible options for the future management of the Antarctic krill fishery in Subarea 48.2 (WG-EMM-16/18).
2. Although commercial fishing of *Dissostichus* spp., is not established in Domain 1, it is important to note that several research programmes to assess *Dissostichus* spp. have been developed by different members, whereas other programmes are currently under review for implementation in the Subarea 48.2 (See CCAMLR Fisheries Report 2016). Considering bottom fishing to target *Dissostichus* spp. is currently permitted by CCAMLR, benthic communities inhabiting these areas might be exposed to disturbance. Previous work has demonstrated the relevance of identifying important benthic areas for conservation in some areas around South Orkney Islands (see WG-EMM-16/35), where seamounts and shelf-incising canyons are an important feature. In this regard, an improvement of our knowledge about representative benthic habitats and important geomorphic features, especially around the eastern part of the SOI (SOI-Benthic), is very relevant considering the importance of benthic communities and also because benthic objectives can be overshadowed by pelagic objectives. Benthic surveys (and special attention on VMEs) can

provide very useful data to improve our knowledge in some of these areas where knowledge is still limited and also to protect these communities and the functional roles they play, from potential disturbance produced by bottom fishing (SC-CCAMLR - XXXVI/BG/XX and XX).

## **CONCLUDING REMARKS**

1- A Domain 1 MPA model was constructed based on the identification of Priority Areas for Conservation and taking into account considerations of krill fishery management and climate change. The model achieved the conservation targets for most of the conservation objectives defined and agreed for Domain 1 (see WG-EMM-17/25 rev. 1).

2- The model incorporated krill fishing activities and climate change by providing differential management strategies including the establishment of General Protection Zones and Special Fishery Management Zones, considering spatial variability and the balance between fisheries and priority areas for conservation.

3- The proposed MPA model covers an area of approximately 450000 sq km, including the SSSOI MPA, allowing for the protection of 19% of the entire Domain 1. Although its size is near 5 times bigger than SSSOI MPA, it is less than 30% smaller than the recently adopted Ross Sea MPA.

4- Important coastal areas for birds, mammals, fishes and zooplankton life cycles of top predators are included in General Protection Zones of NWAP-Foraging grounds and SOI-Benthic, and are represented by protecting roughly the 20% of the proposed MPA and nearly 4% of all Domain 1.

5- While the protection sought for Domain 1 was defined and agreed in several international workshops which resulted in the inclusion of several zones, this MPA model does not envision protection in disregard of fishing activities. Furthermore, it reinforces protection while allowing the rational use of marine living resources.

6- According to this, further considerations for the management of fishing activities in the Domain 1 initiative need to be discussed in order to enable both protection and rational use of resources. The inclusion of different management approaches and also the evaluation of potential risk associated with displacement of fishing activity could be explored following recommendation of the Scientific Committee and the proposed Domain 1 MPA Expert Group.

7- In this regard, Argentina and Chile invite Members and Observers to consider the preliminary Domain 1 MPA model and encourages them to participate in future work towards the designation of a CCAMLR Domain 1 MPA through the Expert Group or other agreed mechanisms.

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**Annex 1.** Table: Coordinates of Domain 1 MPA Preliminary Proposal.

<b>Zone</b>	<b>Longitude</b>	<b>Latitude</b>
SWAP-Emperor	-81.50	-71.80
SWAP-Emperor	-76.40	-71.80
SWAP-Emperor	-76.40	-73.10
SWAP-Emperor	-81.50	-73.10
SWAP-Alexander I Is.	-75.90	-66.70
SWAP-Alexander I Is.	-72.50	-68.60
SWAP-Alexander I Is.	-75.50	-71.10
SWAP-Alexander I Is.	-77.60	-71.10
SWAP-Alexander I Is.	-80.50	-69.40
SWAP-Marguerite Bay	-71.40	-68.60
SWAP-Marguerite Bay	-71.40	-66.30
SWAP-Marguerite Bay	-67.50	-66.30
SWAP-Marguerite Bay	-67.50	-68.60
NWAP-Foraging grounds	-58.70	-63.90
NWAP-Foraging grounds	-63.50	-65.60
NWAP-Foraging grounds	-64.20	-66.10
NWAP-Foraging grounds	-65.10	-66.10
NWAP-Foraging grounds	-66.70	-66.10
NWAP-Foraging grounds	-66.80	-63.50
NWAP-Foraging grounds	-63.00	-61.60
NWAP-Foraging grounds	-58.50	-60.70
NWAP-Foraging grounds	-53.40	-60.70
NWAP-Foraging grounds	-53.40	-62.00
NWAP-Foraging grounds	-54.00	-62.00
NWAP-Foraging grounds	-54.00	-63.90
SOI-Benthic	-49.70	-60.10
SOI-Benthic	-45.10	-58.40
SOI-Benthic	-43.10	-58.40
SOI-Benthic	-43.10	-61.20
SOI-Benthic	-49.70	-61.20