



CCAMLR

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SCIENTIFIC COMMITTEE

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**Candidate baseline data for ecosystem indicators in the Ross Sea region. Part A: Brief presentation of data**

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Delegation of the USA



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## **Candidate baseline data for ecosystem indicators in the Ross Sea region**

### **Part A: Brief presentation of data**

#### Delegation of the USA

A Research and Monitoring Plan for the Ross Sea region MPA (RSRMPA) has been endorsed by the Scientific Committee (SC-CAMLR-XXXVI/20). The Plan identifies research questions that aim to facilitate assessment of the degree to which the RSRMPA achieves its objectives. The Plan also identifies a set of indicators that, when observed or quantified, provide baseline data for key species and characterize the status of the marine ecosystem in the Ross Sea region. These baselines provide benchmarks from which to assess change and evaluate the performance of the MPA. Here, and in an accompanying background paper (SC-CAMLR-XXXVII/BG/xx), we suggest candidate baseline data for seven indicator species listed in the Research and Monitoring Plan and endorsed by the Scientific Committee. These candidates include zone-specific estimates of the mean densities of Antarctic krill, crystal krill, and larval and juvenile Antarctic silverfish in the RSRMPA; zone-specific estimates of the numbers of nesting pairs of Adélie penguins and adult emperor penguins; and region-wide estimates of the numbers of Weddell seals and Type C killer whales.

Before or at the time the RSRMPA entered into force, the Ross Sea region was home to millions of Adélie penguins; tens of thousands of emperor penguins and Weddell seals; thousands of Type C killer whales; and notable concentrations of Antarctic krill, crystal krill, and Antarctic silverfish (Table 1, with additional detail, maps, and data sources provided in SC-CAMLR-XXXVII/BG/xx). From our review of the literature, the data presented here appear to be the most recent region-wide and zone-specific estimates of abundance or biomass for each species. Identifying and adopting baseline data for key indicators is an important step in building an effective research and monitoring plan and establishing trends that population- and ecosystem-dynamics models should reproduce to be useful for providing management advice. We welcome contributions of additional spatial data that characterize the abundance or biomass of the indicator species listed here or of other species that Members feel are relevant to the Research and Monitoring Plan for the RSRMPA. We encourage Members to discuss and adopt baseline data that could be used to assess the efficacy of the MPA in terms of its impact on species biomass or abundance. We have entered all the data presented here into a geographic information system, and will submit this repository to the Secretariat so that it is available to all Members.

Table 1. Candidate baseline data and their sources.

MPA zone or other area	Count of nesting pairs of Adélie penguins	Model estimate of nesting pairs of Adélie penguins	Count of adult emperor penguins	Number Weddell seals	Number of Type C killer whales	Number of Antarctic krill/m <sup>2</sup>	Antarctic krill** g/m <sup>2</sup>	Crystal krill** g/m <sup>2</sup>	Number of Antarctic silverfish**/ 1000m <sup>3</sup>	Number of Antarctic silverfish/ 1000m <sup>3</sup>
<b>SRZ</b>	0	0	0			0	30.59	0.27	8.62	
<b>KRZ</b>	36,587	78,975	1,745			5.47				
<b>GPZi</b>	1,396,925	1,909,032	79,253	30,000-50,000	73 residents and 397 visitors*	20.21	25.8	9.79	689.84	43.375
<b>GPZii</b>	0	0	0			0				
<b>GPZiii</b>	0	0	0			0	2.64			
<b>Outside RSRMPA</b>	0	0	0			0.955	46.78	0.39	0.59	
<b>Region wide</b>	1,433,512	1,988,007	80,998		2,940					
<b>Sources</b>	Most recent counts in MAPPPD (www.penguinmap.com); Humphries et al. 2017	Model estimates from MAPPPD (www.penguinmap.com); Humphries et al. 2017	Kooyman and Ponganis 2016	WG-EMM-10/11; WG-EMM-10/30; Ainley 1985; Stirling 1969	Pitman et al. 2018; WG-EMM-10/11; Ainley et al. 2009	Krillbase (www.bas.ac.uk/project/krillbase/); Atkinson et al. 2017	Davis et al. 2017	Davis et al. 2017	Davis et al. 2017	Brooks et al. 2018

\*Data for McMurdo Sound

\*\*Data for the western Ross Sea

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