

# Annex N

## Report of the Working Group on Whale Sanctuaries

### 1. INTRODUCTORY ITEMS

**Participants:** Parsons (Chair), Rojas-Bracho (Co-Chair), Andriolo, Babey, Banga, Barreto, Bell, E, Burkhardt, Butterworth, Cassani, Cerchio, Chauca, Childerhouse, Cipriano, Citta, Collins, Dalla Rosa, Domit, Double, Evangelista, Findlay, Fisher, Fyfe, Gallego, Germishuizen, Heinemann, Herr, Hielscher, Hines, Holm, Iñíguez Bessega, Johnson, Katara, Kelly, Kolesnikovas, Lang, Leal, Leaper, Lucke, Lundquist, Lysenko, Mallette, Marmontel, Miketa, Minton, Nelson, Olavarria, O’Loughlin, Palazzo, Panigada, Paschoarini Frias, Passadore, Porter, Reeves, R, Reeves, S, Ridoux, Robson, Rojas Urrego, Rose, Ruiz-Sagalés, Seyboth, Simmonds, Slooten, Stachowitsch, Staniland, Sucunza, Tetley, Thompson, Trejos-Lasso, Vermeulen, Wang, Warrie, Weinrich, Webster, Zerbini.

#### 1.1 Opening remarks

The Working Group on Whale Sanctuaries met between 22-24 April 2024, in Bled, Slovenia. Parsons welcomed the Working Group and thanked those who had worked very hard intersessionally to compile information to support the Southern Ocean Sanctuary review and especially the independent Expert Review Panel who compiled the Southern Ocean Sanctuary review report.

### 2. APPOINTMENT OF CHAIRS AND RAPORTEURS

#### 2.1 Election of Chair

Parsons was elected as Chair with Rojas-Bracho as Co-Chair.

#### 2.2 Appointment of Rapporteurs

Fisher and Miketa were appointed as rapporteurs.

#### 2.3 Adoption of agenda

The adopted agenda can be found in Appendix 1.

### 3. REVIEW DOCUMENTS

#### 3.1 Documents available

SC/69B/SAN/01, SC/69B/SAN/02, SC/69B/SAN/03Rev2, SC/69B/SAN/04, SC/69B/CMP/05.

### 4. REVIEW OF THE SOUTHERN OCEAN SANCTUARY

The Southern Ocean Sanctuary (SOS) was established in 1994 and Paragraph 7(b) of the Schedule, which established the SOS, specified that the Sanctuary ‘shall be reviewed ten years after its initial adoption and at succeeding ten-year intervals’. In 2002, the Commission provided further guidance on Sanctuaries and their review in Resolution 2002-1 (IWC, 2002). In 2003, the Commission directed the Committee to undertake the first in a series of decadal reviews of the SOS (1994-2004) (IWC, 2004, pp.47-50). A second review of the SOS was performed in 2014-2016 following terms of reference provided by the Commission (IWC, 2016; 2017). The terms of reference of the third review were agreed in 2022 at SC68D (IWC, 2023) and can be found in Appendix 2.

#### 4.1 Information informing the Southern Ocean Sanctuary review

SC/69B/SAN/02 provided a non-exhaustive compilation of research conducted in the Southern Ocean Sanctuary since 2016 in support of the 3rd Decadal Review of the SOS. Appendices are included that summarise each research project (Appendices I and II) and list a total of 281 SOS-related scientific documents stemming from these projects (Appendix III). A selection of scientific research projects conducted in the contiguous Indian Ocean Sanctuary (IOS) and 22 related documents are included in Appendix IV. The compilation demonstrates that the SOS and contiguous IOS have allowed for the conduct of scientific research useful for meeting IWC objectives.

The Working Group thanked the compilers of SC/69B/SAN/02 noting that the information had been extremely useful for the review of the Southern Ocean Sanctuary.

In discussion, it was noted that the SOS review did not only rely on information submitted to the portal but included other relevant Scientific Committee documents. The Working Group noted the usefulness of maintaining the 2024 review submission portal, so that relevant materials can continue to be submitted and maintained in one place ahead of the next decadal review.

In addition, it was noted that the submission portal could be helpful to encourage submissions related to the South Atlantic Whale Sanctuary, in the event that it is approved.

**Attention:** SC, S, R

*The Working Group **recommends** continued maintenance of the submission portal established for the 2024 decadal review of the SOS and **requests** that the Secretariat notify SC members, Contracting Governments and other interested parties about the portal in order to solicit information on the SOS and IOS on an annual basis. The Working Group also **recommends** that the Secretariat help to maintain and provide the information for the compilation drafting group (Convened by E. Bell).*

#### 4.2 Southern Ocean Sanctuary review report

Childerhouse, Olavarria and Tetley presented the report of the Expert Review Panel of the Southern Ocean Sanctuary (SC/69B/SAN/04). This report was partly revised to reflect clarifications and discussion in the Working Group and can be found in Appendix 3. Species summary-information sheets on whale species within the Southern Ocean Sanctuary produced by the Expert Review Panel can be found in Appendix 1 of SC/69B/SAN/04.

Following discussions within the Working Group, the following conclusions, based on the six criteria in the Terms of Reference for the 2024 Southern Ocean Sanctuary review, were reached:

**1. Assess the present and potential threats to whale populations and their habitats in the area of the SOS and how the Sanctuary addresses this**

*Conclusion:* In conjunction, Paragraph 10(e) of the Schedule (the moratorium), adopted by the IWC in 1982, and the SOS have been effective in addressing the potential threat of commercial whaling for all species and habitats within the SOS, while noting that Special Permit whaling could still occur within the SOS.

While the SOS does not provide any formal protection from most of the other threats identified (i.e., climate change, vessel traffic, etc.), it does provide a strong focus and justification for research and the promotion and implementation of protection mechanisms for whale

populations and their habitat through other international and national mechanisms (e.g., Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), International Union for Conservation of Nature (IUCN), International Maritime Organization (IMO), Antarctic Treaty). Through these collaborations, the IWC has been successful in promoting and supporting the implementation of a wide range of measures to protect whales from a variety of threats within the SOS.

**2. Consider whether the Sanctuary is consistent with other measures to protect whales from anthropogenic and other environmental factors**

*Conclusion:* The SOS, in conjunction with the moratorium and adjoining IOS, provides comprehensive protection against commercial whaling activities by IWC member states. This measure directly contributes to the preservation of whale populations by eliminating an important anthropogenic threat. It is noted that many other international agreements and organisations refer directly to the SOS when considering wider, Southern Ocean ecosystem issues. It is likely that the fact that the SOS exists provides positive impetus for other organisations to both consider and manage threats to whale populations other than whaling. Overall, the SOS is consistent with other measures to protect whales from anthropogenic and other environmental factors.

**3. Assess the effects of the Sanctuary in terms of the protection of whales in breeding areas, feeding grounds, and/or migratory routes**

*Conclusion:* The SOS, moratorium and adjoining IOS provide complete protection from any existing or future commercial whaling by IWC member nations (and are likely to deter non-IWC members from conducting whaling as discussed in SC/69B/SAN/04) for the populations of baleen whales that breed in the Indian Ocean. This includes their feeding and breeding grounds and also migratory routes. With respect to the remainder of the Southern Hemisphere, the SOS provides protection for Antarctic feeding grounds but there is no equivalent lower latitude protection afforded by an IWC Sanctuary although, it is noted that a South Atlantic Whale Sanctuary has previously been proposed.

**4. Assess the effects of the Sanctuary in terms of international agreements concerning biodiversity and conservation of nature**

*Conclusion:* The SOS provides a strong focus and justification for the promotion and implementation of protection mechanisms for whale populations and their habitat through other international and national mechanisms (e.g., CCAMLR, IUCN, IMO, United Nations Convention on the Law of the Sea (UNCLOS), Antarctic Treaty). We note that many of these other international agreements and organisations refer directly to the SOS when considering wider Southern Ocean ecosystem issues. The existence of the SOS provides information and positive impetus for other organisations to both consider and manage threats to whale populations other than whaling.

**5. Evaluate whether the Sanctuary allows for the conduct of scientific research useful for meeting IWC objectives or coordinated integrated research and monitoring programmes across the range of issues of global relevance**

*Conclusion:* The SOS serves as a pivotal platform for conducting scientific research that aligns with IWC objectives and contributes to global marine conservation efforts. Coordinated long-term and ongoing research and monitoring programs, together with standardised reporting processes, underscore the Sanctuary's commitment to facilitating comprehensive and systematic research endeavours. This initiative has enabled the collation of important data on whale populations, their

habitats, and the broader Antarctic marine ecosystem, thereby supporting the IWC's scientific and conservation mandates.

**6. Provide advice on whether the Sanctuary is consistent with the precautionary principle**

*Conclusion:* The SOS's establishment and ongoing management take into account the Precautionary Approach as specified in Principle 15 of the Rio Declaration on Environment and Development in 1992 (commonly known as the precautionary principle).

Further conclusions from the Expert Review Panel can be found in Table 1.

Table 1  
Further Conclusions from the Expert Review Panel for the Southern Ocean Sanctuary

(i) Refinement and Articulation of Sanctuary Objectives: (a) Develop and clarify the specific conservation objectives of the SOS in light of emerging environmental challenges such as climate change and increased human activities; and (b) Ensure that these objectives are clearly articulated and integrated with other IWC management strategies to ensure comprehensive protection. The Commission may wish to consider amending the management plan with additional conservation objectives.
(ii) Performance Measures and Monitoring Strategy: Establish clear, quantifiable performance measures for each objective of the SOS. These should be linked to updated and adaptive monitoring programs that reflect the dynamic environmental and ecological conditions within the sanctuary.
(iii) Systematic Research and Inventory Programs: (a) Continue to build and update a comprehensive inventory of research and monitoring programs that contribute to the management of the SOS; and (b) Encourage international collaboration in research initiatives, especially those focusing on the impacts of climate change and anthropogenic pressures on whale populations within the sanctuary.
(iv) Development and Periodic Review of the Management Plan: (a) Develop the management plan for the SOS, updating the existing plan to align with the latest scientific research and conservation priorities; and (b) Ensure that the management plan includes specific actions and strategies that are needed to achieve the sanctuary's objectives, incorporating adaptive management strategies to respond to new scientific information and environmental changes.
(v) Establishment of Review Criteria and Performance Indicators: (a) Define clear criteria for periodic reviews of the SOS to ensure that its management remains effective and relevant. These criteria should be linked to the performance measures and should reflect the goals and objectives of the sanctuary; and (b) Develop tangible indicators for monitoring progress toward meeting the sanctuary objectives, including ecological and conservation benchmarks.
(vi) Enhanced Integration with International Agreements and Conservation Measures: (a) Assess and enhance the alignment of the SOS with other international measures for marine conservation, such as the UNCLOS Biodiversity Beyond National Jurisdiction (BBNJ) Agreement, to ensure consistent and complementary management approaches; and (b) Strengthen collaborations with global and regional conservation bodies, such as the IUCN, Convention on Biological Diversity (CBD) and the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), to synergize efforts in marine biodiversity conservation.
(viii) Consistency with the Precautionary Principle: (a) Continuously evaluate and ensure that the management of the SOS is consistent with the precautionary principle, advocating for proactive measures in the face of scientific uncertainty; and (b) Update the sanctuary's strategies based on the latest scientific insights and environmental assessments, ensuring robust protective measures for marine biodiversity.

The Working Group broadly supports the conclusions of the Expert Review Panel introduced in SC/69B/SAN/04.

The Working Group recalled that the Southern Ocean Sanctuary Management Plan, adopted by the Commission in 2018 (IWC, 2018, IWC/67/CC/06) included updated, specific and measurable objectives and identified research, implementation actions and performance measures many of which relate to potential threats to whale populations within the SOS region. The refined objectives within the Management Plan expanded the objectives of the SOS from the management of commercial whaling into other areas, including:

- Objective 1: Contribute to the rehabilitation of a marine ecosystem damaged by the overexploitation of whales and allow for the restoration of a complex of whale species and populations.
- Objective 2: Secure a long-term satisfactory habitat for cetaceans and other marine life.
- Objective 3: In combination with the Indian Ocean Sanctuary, fully protect at least one population of each of the great whales throughout its migratory range and life-cycle, i.e., on feeding and breeding grounds, to provide for their long-term conservation.

- Objective 6: Allow for coordinated research on the effects of environmental change on whale stocks.

While there is no specific mechanism within the Convention to address these broader objectives, they were adopted by the Commission and, therefore, represent the direction provided to the SC relating to the SOS. The SOS Management Plan identifies potential approaches and actions that the IWC can take to achieve these objectives, which include:

- Encouraging Contracting Governments, range States, particularly in the Indian Ocean, IGOs and NGOs to address threats identified by the IWC;
- Encouraging complementary actions from international agencies (e.g., CCAMLR, IMO);
- Developing and maintain collaborations through the Southern Ocean Research Programme (IWC-SORP), CCAMLR, Scientific Committee on Antarctic Research (SCAR), Scientific Committee on Oceanographic Research (SCOR), Southern Ocean Observing System (SOOS) etc. Contributing information about whales and their habitats to relevant international research programmes.

Given these substantive changes to the objectives of the SOS over time, it is appropriate to seek advice from the Commission about future reviews of the SOS; specifically, how, and how frequently, these should be carried out and using what criteria.

#### **Existing Sanctuary review criteria**

The Commission adopted the following terms of reference in 2014:

1. Provide advice on the status and trends of whale stocks in the Southern Ocean Whale Sanctuary in so far as these are known. Assess the present and potential threats to whale populations and their habitats in the area of the Sanctuary and the complementary Indian Ocean Sanctuary and how the Sanctuaries address these.
2. Consider whether the Sanctuary is consistent with other measures to protect whales from anthropogenic and other environmental factors.
3. Assess the effects of the Sanctuary and the contiguous Indian Ocean Sanctuary in terms of:
  - a. The protection of whales in breeding areas, feeding grounds, and/or migratory routes.
  - b. International agreements concerning biodiversity and conservation of nature.
4. Evaluate whether the Sanctuary allows for the conduct of scientific research useful for meeting IWC objectives or coordinated integrated research and monitoring programmes across the range of issues of global relevance.
5. Provide advice on whether the Sanctuary is consistent with the precautionary approach.

The Working Group **welcomed** the thoughtful and useful review conducted by the Expert Review Panel. After discussion, and bearing the Panel's recommendations in mind, it noted that the criteria that were used for both the second and third Decadal review of the SOS (see above) are now 10 years old and were developed prior to the Commission adopting the SOS Management Plan in 2018. The SOS Management Plan has considerably changed the objectives of the SOS and, therefore, the terms of reference for the review of sanctuaries adopted in 2014 are no longer consistent with the new objectives.

**Attention:** SC, S, CC, C

*The Working Group **agrees** that the 2014 terms of reference for sanctuary review need to be revised and updated to align them with the SOS Management Plan.*

The Working Group **agrees** to establish a Sanctuary Review Criteria Intersessional Correspondence Group (ICG) to develop updated sanctuary review criteria broadly consistent with the SOS Management Plan (Convened by Double).

The Working Group **recommends** that the ICG develop a report to be presented to the next SC for consideration.

#### 4.3 Other relevant Southern Ocean Sanctuary information

SC/69B/SAN/01 noted that the sub-Antarctic island at 54°15'S 36°45'W was a major centre of whaling in the first half of the 20th century and lies within the Southern Ocean Sanctuary. The krill fishery around the island operates exclusively in the winter months, but data on krill and krill-dependent predators during winter are limited. Visual and acoustic surveys of baleen whales were carried out between April and September in 2022 and 2023 as part of a two-year project investigating the abundance and density of krill and krill-feeding predators around the island in the austral winter. Acoustic surveys using DiFAR sonobuoys were also conducted. Analyses of this work are ongoing in order to relate observed distributions of whales to krill occurrence and density to inform management measures and should be captured in future compilations of relevant research.

### 5. PROGRESS ON PREVIOUS RECOMMENDATIONS

#### 5.1 Indian Ocean Sanctuary

In response to previous recommendations (SC19156), SC/69B/SAN/03Rev2 provided an update on the Indian Ocean Cetacean Network (IndoCet) which focuses on cetacean research and conservation in the south-western Indian Ocean (SWIO). The network maintains a website, as well as a newsletter and social media pages. The website includes a regional literature repository, a 'metadata' page (telemetry, photo-ID, biopsy, acoustics) and a "Report a Stranding" page that standardises/centralises SWIO strandings data and provides guidance on species identification and stranding response. Whale disentanglement workshops in partnership with the IWC were held in Reunion and Mayotte (June 2023) and a refresher workshop was held in Kenya (March 2024). A new initiative called the 'Network of Marine Mammal Observers' (NeMMO) aims to increase the quality, quantity, and availability of cetacean data in the SWIO through MMO's working onboard platforms of opportunity. Data are stored in a GIS database on the Sextant/SIMM-OI portal and currently includes 1,139 cetacean sightings of 24 different species. IndoCet members have worked with HappyWhale (see HappyWhale.com) to upload/match SWIO humpback whale photo-identification data. The aim is to produce estimates of abundance and between-region exchanges for the next IWC in-depth assessment. Other ongoing initiatives include the COMBAVA project which assesses humpback whale song structure and temporal distribution in the SWIO, the QWIO project (Quieter Western Indian Ocean), an assessment of threats to marine megafauna associated with shipping (underwater radiated noise, ship strikes) and the Indian Ocean Humpback Dolphin Conservation Network (HuDoNet), a consortium focused on *Sousa plumbea*. SWIO humpback whale telemetry datasets have been collated on the IndoCet website (Fossette *et al.*, 2014; Cerchio *et al.*, 2016; Dulau *et al.*, 2017; also see <https://indocet.org/en/home/>) to which more recent tagging data will be added; Reunion in 2019-22 and Tanzania in 2023.

The Working Group thanked the compilers of SC/69B/SAN/03 for this very useful update on ongoing, collaborative work in the Indian Ocean Sanctuary. Moreover, the Working Group was impressed with how much IndoCet has been able to accomplish and commends the coordinators for driving this work forward.

The Working Group **welcomes** further updates through the portal and at future meetings about cetacean

research and conservation work in the Indian Ocean Sanctuary region from IndoCet.

Appendix IV of SC/69B/SAN/02, in combination with Appendices I-III of de la Mare *et al.* (2016), provide non-exhaustive compilations of scientific research and monitoring projects conducted in the IOS.

SC/69B/CMP/05 provides an overview of cetacean research and conservation activities being implemented by the Arabian Sea Whale Network and its members. At a regional level, the Convention on Migratory Species' (CMS) Concerted Action for Arabian Sea humpback whales has been extended through 2027 with a view toward the development of a joint CMS-IWC regional Conservation Management Plan (CMP). The Network also serves as a platform for exchange of experience and expertise through an email platform, a website (<https://arabianseawhalenetwork.org/>) and social media posts. At project and national levels, members have made significant strides in documenting cetacean sightings and strandings through dedicated research and citizen science networks and increasing the in-country capacity for cetacean research and conservation management. Increased involvement and investment from government stakeholders in cetacean research and conservation is also evident in the region.

At SC68B and SC69A, the Committee recommended that guidance be requested from the Commission about conducting a review of the Indian Ocean Sanctuary. As yet, no guidance has been forthcoming.

## 5.2 Other

No other progress on previous recommendations was reported.

## 6. BIENNIAL WORKPLAN

At SC68B and SC69A the Committee recommended that guidance be requested from the Commissioners for the IOS review. However, as yet no guidance has been forthcoming.

Should a review of the IOS be requested, considering the new biennial format of the Scientific Committee, a review could be conducted in 2028. The reviewer selection process used for the SOS review would ideally be applied to the IOS review.

The work plan was agreed upon by the Working Group and can be found in Table 2. Future work pertaining to the IOS review is contingent on direction from the Commission.

Table 2  
Proposed Work Plan for SAN

Item	Intersessional	2026	Intersessional	2028
Intersessional review of Sanctuary terms of reference	X			
ICG reports to SC		X		
Receive documents relevant to SOS review via portal		X	X	X
Receive documents relevant to the IOS via portal		X	X	X
Receive guidance from Commission on IOS review		X		
Plan IOS review		X	X	X
Finalise and invite IOS reviewers			X	X
Conduct IOS review				X
Report outcome of IOS review				X

The report was approved at 2:30pm on 24 April 2024.

## REFERENCES

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- International Whaling Commission (2016). Report of the Scientific Committee: Annex O. *J. Cetacean Res. Manage.* Suppl. 17: 406-07.
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- International Whaling Commission (2023). Report of the Scientific Committee (SC68D). *J. Cetacean Res. Manage.* Suppl. 24: 1-190.



## **Appendix 1**

### **AGENDA**

1. Introductory remarks
2. Appointment of Chair(s) and Rapporteurs
3. Review documents
4. Review of the Southern Ocean Sanctuary
  - 4.1 Information informing the Southern Ocean Sanctuary review
  - 4.2 Southern Ocean Sanctuary review report
  - 4.3 Other relevant Southern Ocean Sanctuary information
5. Progress on previous recommendations
  - 5.1. Indian Ocean Sanctuary
  - 5.2. Other
6. Biennial workplan

## Appendix 2

### 2024 SOUTHERN OCEAN SANCTUARY REVIEW TERMS OF REFERENCE

[The following is extracted from IWC, 2023, Appendix 2: Southern Ocean Sanctuary Review Terms of Reference.]

Taking into consideration previous instructions from the Commission to the Committee for Review of Sanctuaries (IWC, 2002) and Resolution 2002-1 providing guidance to the Committee on the Sanctuary review process (IWC, 2003), the following terms of reference for the review of Sanctuaries were developed (IWC, 2016).

1. Provide advice on the status and trends of whale stocks in the Sanctuary in so far as these are known. Assess the present and potential threats to whale populations and their habitats in the area of the Sanctuary and how the Sanctuaries address this.
2. Consider whether the Sanctuary is consistent with other measures to protect whales from anthropogenic and other environmental factors.
3. Assess the effects of the Sanctuary in terms of:
  - a) the protection of whales in breeding areas, feeding grounds, and/or migratory routes; and
  - b) international agreements concerning biodiversity and conservation of nature.
4. Evaluate whether the Sanctuary allows for the conduct of scientific research useful for meeting IWC objectives or coordinated integrated research and monitoring programmes across the range of issues of global relevance.
5. Provide advice on whether the sanctuary is consistent with the precautionary approach.

At SC68C, the Committee agreed (Item 18.3) that the Terms of Reference for the review of the SOS should be discussed, taking into account the broadening scientific range covered by the Committee; for example, the role of ecosystem functioning as discussed in the Standing Working Group on Ecosystem Modelling.

The Committee encourages papers and information on ecosystem modelling relevant to the SOS to be submitted to the Steering Group for inclusion in the review. Due to the major impacts of climate change in the Southern Ocean, the Committee agrees that climate change should be explicitly noted as an anthropogenic factor in item (b).

#### REFERENCES

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## Appendix 3

### THE THIRD DECADAL REVIEW OF THE IWC SOUTHERN OCEAN SANCTUARY

M. Tetley, C. Olavarri and S. Childerhouse

#### BACKGROUND ON IWC SANCTUARIES

The International Convention for the Regulation of Whaling was signed in 1946. It established the International Whaling Commission (IWC, <http://www.iwcoffice.org>). Decisions of the Commission on conservation and management are taken upon advice from its Scientific Committee (SC). Article V of the Convention indicates that one possible management action of the IWC is to designate sanctuaries: Article V, numeral 1: the Commission may amend from time to time the provisions of the Schedule by adopting regulations with respect to the conservation and utilisation of whale resources, fixing [...] (c) open and closed waters, including the designation of sanctuary areas; [...] (IWC, 1946).

In designating a sanctuary under the Convention, the only formal regulatory measures that can be taken involve prohibiting commercial or aboriginal subsistence whaling. Other management measures include restricting seasons and limiting catches based on scientific assessments (IWC, 2023).

Two sanctuaries have been designated by the IWC (Fig. 1) and are currently included in the Schedule (IWC, 2022a; section III Captures, paragraph 7), both of which prohibit commercial whaling, whether by pelagic operations or from land stations.

The first of these, the Indian Ocean Sanctuary (IOS), was established in 1979 and covers the whole of the Indian Ocean south to 55°S. This comprises the waters of the Northern Hemisphere from the coast of Africa to 100°E, including the Red and Arabian Seas and the Gulf of Oman; and the waters of the Southern Hemisphere in the sector from 20°E to 130°E, with the southern boundary set at 55°S (IWC, 2022a; Fig. 1).

The second sanctuary, the Southern Ocean Sanctuary (SOS), was adopted in 1994 and covers the waters of the Southern Ocean, around Antarctica. This Sanctuary roughly comprises the waters of the South Atlantic and the western South Pacific from 40°S south, of the Indian ocean from 55°S south and of central and eastern South Pacific from 60°S south (IWC, 2022a; Fig. 1).

The prohibition of commercial whaling applies irrespective of the conservation status of baleen and toothed whale stocks in this Sanctuary. As part of the setting up of the SOS, it was agreed that this prohibition shall be reviewed ten years after its initial adoption and at succeeding 10-year intervals and could be revised at such times by the Commission (IWC, 2022a).

In 2003, the Commission directed the SC to undertake the first decadal review of the SOS (i.e., 1994-2004) (IWC, 2005). A second decadal review of the SOS was completed in 2016 (IWC, 2017).

At the previous decadal reviews of the SOS in 2004 and 2016, the SC recommended that the SOS should have a management plan that linked objectives to measurable or identifiable outcomes. A draft plan was presented for discussion to the Scientific and Conservation Committees in 2018 (IWC/67/CC/06) and it was duly endorsed by the Commission (IWC, 2018a).

The third review of the SOS will occur at the 2024 meeting of the SC. The review group will meet on 22-24 April 2024 in Bled, Slovenia. The terms of reference of the third review were agreed by the SC in 2021 (IWC, 2022b).

### **THE SOUTHERN OCEAN SANCTUARY (SOS)**

The SOS was proposed by the French Government in 1992 and adopted by the IWC in 1994, with the provision that it would be reviewed every 10 years. The original proposal stated that its primary purpose was to ‘contribute to the rehabilitation of the Antarctic marine ecosystem by reinforcing and complementing other measures for the conservation of whales and the regulation of whaling, in particular by the protection of all Southern Hemisphere species and populations of baleen whales and the sperm whales on their feeding grounds.’

The objectives of the SOS, provided by the IWC’s Resolution 1998-3 (IWC, 1998), are:

1. The recovery of whale stocks, including the undertaking of appropriate research upon and monitoring of depleted populations;
2. The continuation of the Comprehensive Assessment of the effects of setting zero catch limits on whale stocks; and
3. The undertaking of research on the effects of environmental change on whale stocks.

The SOS comprises the waters of the Southern Hemisphere southwards of the following line: starting from 40°S, 50°W; thence due east to 20°E; thence due south to 55°S; thence due east to 130°E; thence due north to 40°S; thence due east to 130°W; thence due south to 60°S; thence due east to 50°W; thence due north to the point of beginning. Between 20°E and 130°E, the northern boundary is contiguous with the Indian Ocean Sanctuary (Figure 1).

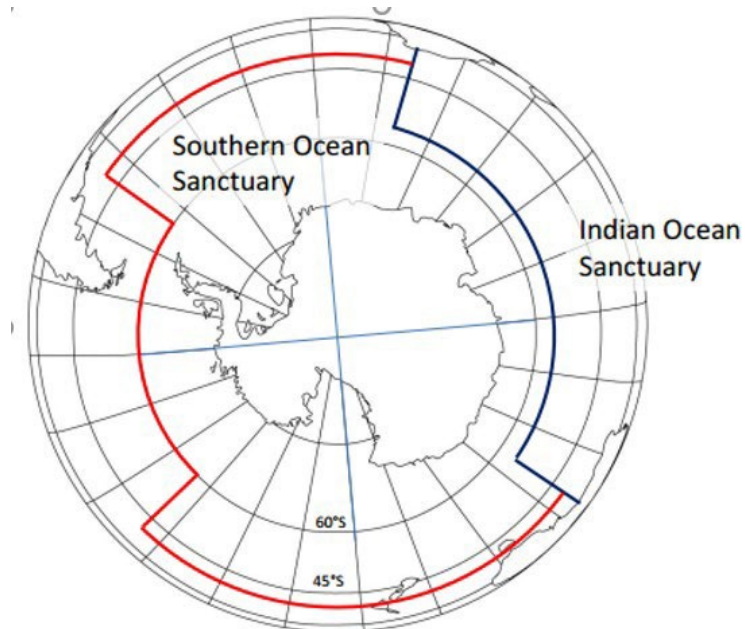


Figure 1. The Southern and Indian Ocean Sanctuaries

Several whale species are mentioned in the Schedule (IWC, 2022a; section I Interpretation, paragraph 1), including the following baleen and toothed whales that are found in the SOS (Table 1).

Table 1

Cetacean species in the Schedule occurring in the Southern Ocean Sanctuary

Baleen whales	Toothed whales
blue whale ( <i>Balaenoptera musculus</i> ) including pygmy blue whale	beaked whale means any whale belonging to the genus <i>Mesoplodon</i> , or any whale known as Cuvier's beaked whale ( <i>Ziphius cavirostris</i> ), or Shepherd's beaked whale ( <i>Tasmacetus shepherdi</i> ).
fin whale ( <i>Balaenoptera physalus</i> )	bottlenose whale means any whale known as ... Arnoux's whale ( <i>Berardius arnuxii</i> ), southern bottlenose whale ( <i>Hyperoodon planifrons</i> )
humpback whale ( <i>Megaptera novaeangliae</i> )	killer whale ( <i>Orcinus orca</i> )
minke whale ( <i>Balaenoptera acutorostrata</i> , <i>B. bonaerensis</i> )	pilot whale means any whale known as long-finned pilot whale ( <i>Globicephala melaena</i> )
pygmy right whale ( <i>Caperea marginata</i> )	sperm whale ( <i>Physeter macrocephalus</i> )
southern right whale ( <i>Eubalaena australis</i> )	
sei whale ( <i>Balaenoptera borealis</i> )	

However, during the first decadal review, it was accepted that the 'discussions would only focus on great whales during the review of the SOS' (IWC, 2005), which was also accepted for the second review due to a lack of consensus amongst members about the status of small cetaceans and other species not listed in the Schedule (IWC, 2017). The draft SOS Management Plan endorsed by the Commission (IWC/67/CC/06) focused on all 'whale' species that were subject to commercial whaling within the SOS area, specifically: blue whale, pygmy blue whale, fin whale, sei whale, Antarctic minke whale, common minke whale, humpback whale, southern right whale, sperm whale and killer whale.

Following the two previous reviews and for consistency, in this third decadal review, we will be focused on the nine migratory species/subspecies of whales that are found within the SOS: 'true' blue whale (*B. musculus intermedia*) and pygmy blue whale (*B. m. brevicauda*); fin whale (*B. physalus*); sei whale (*B. borealis*); Antarctic minke whale (*B. bonaerensis*); common minke whale (*B. acutorostrata*); humpback whale (*Megaptera novaeangliae*); southern right whale (*Eubalaena australis*) and sperm whale (*Physeter macrocephalus*). However, we note that it is unclear why previous reviews excluded killer whale, pygmy right whale, beaked whales and pilot whales, despite these species being included in the Schedule. Their inclusion might be considered for future decadal reviews of the SOS.

IWC has six designated management areas in the Southern Hemisphere (Areas I to VI) for baleen whales including those that inhabit waters of the Southern Ocean Sanctuary during their feeding season. There are also nine management divisions (Divisions 1 to 9) for sperm whales (see Figs. 2 and 3). However, it should be noted that these designated boundaries do not necessarily reflect the most recent information on stock structure. For example, the SC has accepted seven breeding populations (A to G) for humpback whales.

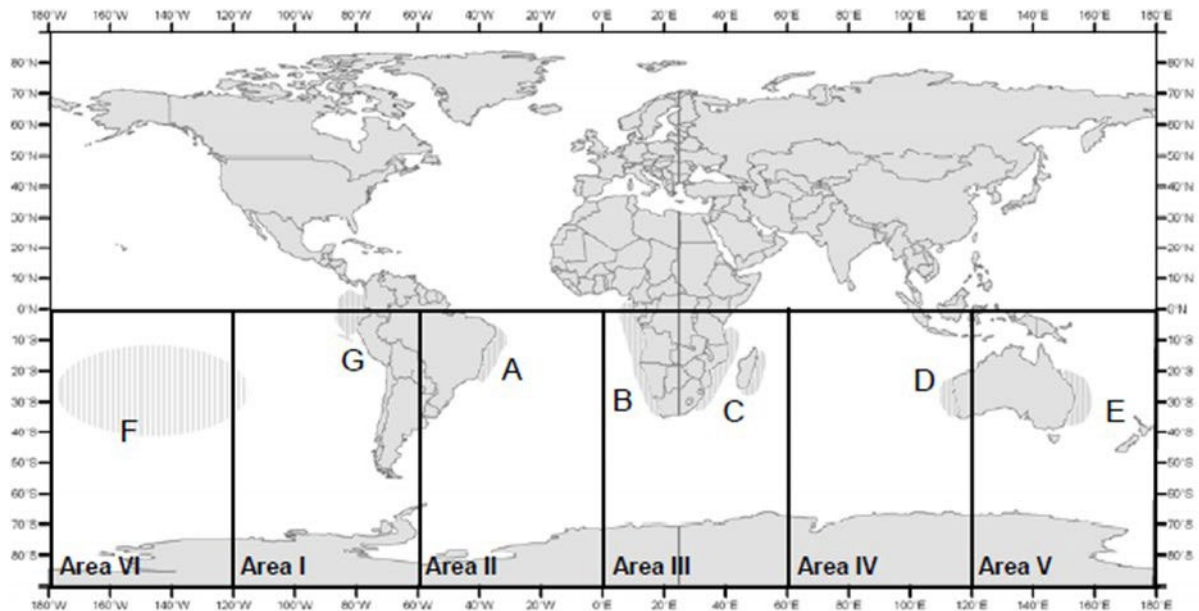


Fig. 2. IWC Management Areas for baleen whales (I - VI) and humpback whale breeding populations (A-G) in the Southern Hemisphere.

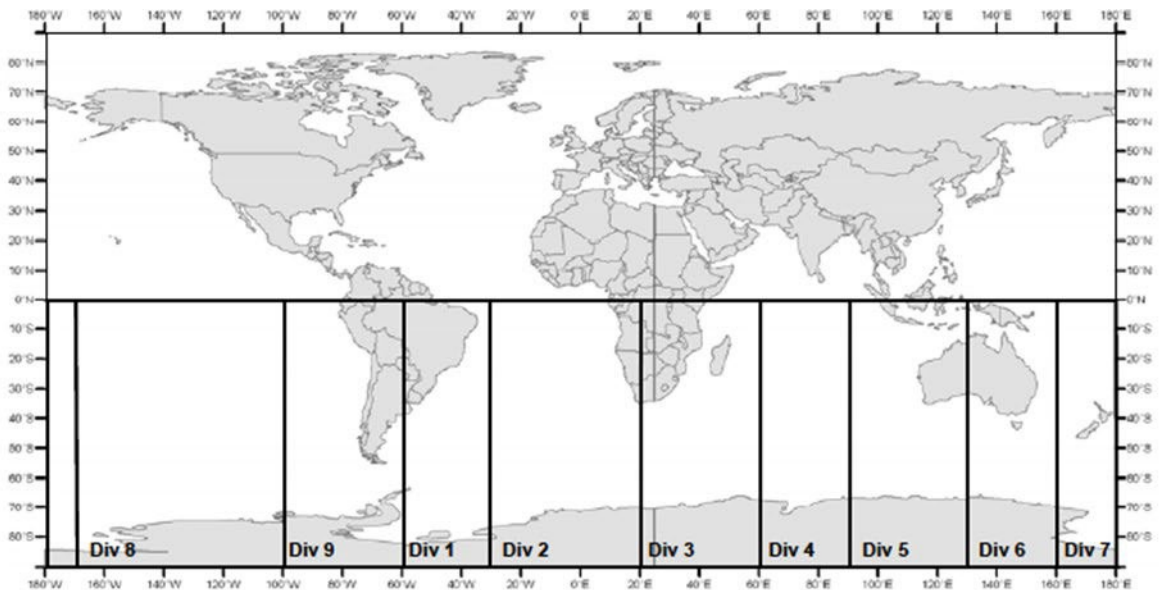


Fig. 3. IWC Management Divisions (1-9) for sperm whales in the Southern Hemisphere.

### TERMS OF REFERENCE FOR THE 2024 REVIEW

The terms of reference for the first review followed two main tasks (IWC, 2005):

1. Evaluate the SOS, given its objectives and criteria developed by the SC and approved by the Commission; and
2. Provide advice on how to introduce Marine Protected Area (MPA) scientific concepts into IWC Sanctuaries and Sanctuary Proposals, and on establishing monitoring programmes.

The second and the current third SOS reviews utilised the following terms of reference for the review of Sanctuaries (IWC, 2016):

1. Provide advice on the status and trends of whale stocks in the Sanctuary as far as these are known. Assess the present and potential threats to whale populations and their habitats in the area of the Sanctuary and how the Sanctuaries address this.
2. Consider whether the Sanctuary is consistent with other measures to protect whales from anthropogenic and other environmental factors.
3. Assess the effects of the Sanctuary in terms of:
  1. the protection of whales in breeding areas, feeding grounds, and/or migratory routes; and
  2. international agreements concerning biodiversity and conservation of nature.
4. Evaluate whether the Sanctuary allows for the conduct of scientific research useful for meeting IWC objectives or coordinated integrated research and monitoring programmes across the range of issues of global relevance.
5. Provide advice on whether the sanctuary is consistent with the precautionary principle.

At SC68C (IWC, 2022b), the Committee agreed (Item 18.3) that the Terms of Reference for the review of the SOS should be discussed, taking into account the broadening scientific range covered by the Committee. For example, the inclusion of the role of ecosystem functioning as discussed in the Standing Working Group on Ecosystem Modelling. The Committee encouraged papers and information on ecosystem modelling relevant to the SOS to be submitted to the Steering Group for inclusion in the review. Due to the major impacts of climate change in the Southern Ocean, the Committee agreed that climate change should be explicitly noted as an anthropogenic factor in item (2).

#### **METHODOLOGY FOR THE REVIEW**

The review followed previously applied methods, which included reviewing a range of material from various sources. Primarily, we utilised web-based search engines (e.g., Google, Google Scholar, Scopus), general literature searches including IWC scientific archives, discussions with colleagues and experts with knowledge of the region, plus our own personal experience and knowledge. In completing our review, we made consensus-based decisions and, where consensus was not possible in the time available, provided a range of views of the authors. We have not included a comprehensive reference list for all the citations considered during the review and have only provided citations for key references when required. We would also direct readers to previous and ongoing summaries of literature relevant to the SOS (e.g., SC/69A/SAN/01; Stachowitsch *et al.*, 2023).

#### **REVIEW ASSESSMENT**

##### **Assess the present and potential threats to whale populations and their habitats in the area of the SOS and how the Sanctuary addresses this**

We have broken down this section into subsections and provide an overview and summary at the end. Additional details of threats for specific species and stocks are provided in Appendix 1.

##### **Whaling**

Although commercial whaling is prohibited within the SOS, there is a hypothetical potential for illegal, unreported and unregulated (IUU) whaling operations or even potentially Special Permit whaling that could impact specific whale populations. While IUU fishing is well documented within the Southern Ocean, there is no available information available about IUU whaling. However, it is possible to speculate that if there were such activities within the region, they are likely to be detected by national and international monitoring programmes that are targeted at IUU fishing. We assume that IUU whaling is highly unlikely

within the region. Special Permit whaling has a long history in Antarctic waters but is no longer operating, noting that technically any nation could start special permit whaling at any time following the rules set out in the Convention. Continued international cooperation is critical to mitigate this potential threat. The SOS complements other existing controls on commercial whaling operations

### **Climate change**

The most pervasive threat identified beyond whaling operations was climate change which could have potential flow on effects to regional whale populations through a range of impacts including significant reductions in ice cover resulting in reduced krill populations (a primary food source for many whale species), as well as ocean acidification (Stachowitsch et al., 2023). Changes in sea ice patterns could also alter the location of present whale Antarctic feeding areas leading to changes to whale migration routes and feeding grounds. Climate change is also likely to affect the prey of toothed whales with similar potential effects. Such changes could also make whale populations more vulnerable to other threats. More broadly speaking, climatic changes to the Southern Ocean ecosystem is likely to contribute to, or exacerbate, changes going on in other parts of the world which may impact whale feeding grounds and migratory routes. The SOS does not provide any direct protection for whale populations from climate change but does provide an important area in which the effects of climate change can be studied. The global nature of climate change and that most emissions contributing to global climate change are from the Northern Hemisphere, mean that the SOS is not the optimal tool for managing potential effects on whale populations.

### **Fishing**

Incidental bycatch in fishing gear and competition for food resources due to overfishing of krill and other species pose significant threats to whale populations (Leaper *et al.*, 2022). Specifically, catches of toothfish (both *Dissostichus mawsoni* and *D. eleginoides*), the prey for many toothed whales are increasing in both spatial coverage and amount in many areas plus there is also additional IUU catch in some areas. Krill fishing is also growing to the point where it has been suggested that fishing impacts might be higher than previously thought (Meyer *et al.*, 2020). The spatial extent and amount of krill catch is also increasing. Overall, potential impacts on whale populations from competition with commercial fisheries documented since the last Review (IWC, 2017) are increasing and impacts are also likely to be increasing, albeit the level of impact is likely to vary significantly between areas and species. Incidental bycatch appears to be relatively low compared with global fisheries more generally but notable is the recent bycatch of humpback whales from vessels utilising continuous krill trawl nets (Leaper *et al.*, 2022) which requires further investigation and monitoring. Improved fisheries management and the adoption of bycatch mitigation technologies are essential. We also direct people to the recent reports of the Subcommittee on non-deliberate human-induced mortality of cetaceans for further information about these issues. The SOS does not provide any protection from threats from fisheries other than providing a strong focus and justification for the advocacy and implementation of protection mechanisms for whale populations in other fora (e.g., CCAMLR).

### **Shipping**

Vessel traffic within the SOS is relatively low compared with other parts of the globe although there is good evidence that both within the Southern Ocean and in some areas adjoining the SOS, particularly the IOS, there has been a documented increase in shipping traffic. While the global COVID shutdown reduced vessel traffic to the Antarctic, vessel numbers have increased strongly since with the suggestion that the number of vessel visits will continue to grow. With increased vessel traffic comes increased risks of ship strikes, noise pollution, and oil spills. These are not issues unique to the SOS region but are common global issues. Alignment with competent authorities (e.g., International Maritime Organisation ) is necessary in



supporting the implementation of and enforcement of mitigation measures to reduce risks to whales and habitats. The Polar Code (IMO, 2017), initiated in 2017, is an international code for the safety of ships operating in polar waters. It covers a comprehensive range of design, construction, equipment, operational, training, search and rescue, and environmental protection matters relevant to shipping in the inhospitable and environmentally sensitive waters surrounding the two poles. The development of this mandatory code by the IMO reflects the need to address the unique hazards faced by maritime traffic in the Arctic and Antarctic environments, including ice navigation and the vulnerability of polar ecosystems to human activities.

### **Oil and gas exploration and exploitation**

While oil, gas and mining exploration and exploitation are currently limited within the SOS, any expansion poses significant risks through habitat destruction, increased noise pollution, oil spills, and increased maritime traffic. Aligned closely with exploration are seismic surveys which have the potential to significantly impact whale populations both directly (e.g. physiological hearing damage, displacement) and indirectly (e.g., effects on prey such as krill; McCauley *et al.*, 2017). This increase in seismic activity is part of a broader trend of growing human activity in the region, including marine research that uses seismic methods to study undersea geology and oceanography (Dickinson & Gunn, 2022). These activities are part of global efforts to better understand oceanic structures and processes but also highlight the need for careful management and mitigation of environmental impacts. Anecdotal evidence suggests that most seismic surveys generally comply with any regulations relevant to marine mammals from the country undertaking the survey, but regulations vary considerably from reasonable to non-existent. Alignment with strict environmental impact assessments and international regulations (e.g., the Antarctic Treaty) are necessary to manage and control these activities and potentially be strengthened to provide appropriate protection to significant Antarctic feeding grounds. It was noted that although deep sea mining within the SOS is currently prohibited by the Antarctic Treaty, this is an emerging issue worldwide, including within the Scientific Committee. Attention is directed to SC/69B/E/08 on this topic.

### **Pollution**

Overall, the Southern Ocean has lower levels of pollution than much of the Northern Hemisphere. Persistent organic pollutants, plastics, and noise pollution affect whale health and breeding success. International efforts to reduce pollution sources and clean up existing marine debris are vital and the IWC is working through a number of programmes to understand and mitigate potential threats from a range of different types of debris. In 2022, the Commission endorsed a resolution on marine plastic pollution (IWC/68/8.1/01/Rev2), recognising the transboundary nature of marine plastic pollution and the importance of international cooperation by IWC members and other international organisations, bodies and instruments. Activity set out in the Resolution includes increased collaboration and cooperation with relevant international organisations and SC work towards identifying hotspots of cetacean exposure to plastic debris. As with other threats the SOS does not provide any formal protection from pollution but can provide a strong focus and justification for the advocacy and implementation of protection mechanisms for whale populations in other fora (e.g., IMO).

### **Tourism and whale watching**

Tourism, of which whale watching comprises a small part, is relatively uncommon around most of the Antarctic continent with the possible exception of the Antarctic Peninsula where it is increasing steadily following the global shutdown for COVID-19. While rare elsewhere, there is also increasing vessel traffic around much of the continent. While beneficial for raising awareness, marine tourism activities within the SOS, if not carefully managed, can impact on whales through noise, disturbance, displacement and vessel strike. Guidelines and regulations for sustainable whale watching practices and general vessel behaviour

are crucial to minimise impacts, as well as ensuring that increasing marine vessel activity within sensitive breeding and feeding habitats do not exceed sustainable levels (IWC, 2018b). There are also some excellent examples of citizen science being undertaken on tourist vessels in the Antarctic, which have made good contributions to our understanding of whale populations. Tourism vessels for citizen science research offers a valuable opportunity to gather crucial data on marine species, particularly whales, while engaging the public in conservation efforts. However, it is essential that all whale watching operations are sustainable and well-managed to ensure they do not adversely affect the very species they aim to protect. To achieve this, operators and participants should adhere to the guidelines and best practices outlined in the IWC Whale Watching Handbook. This resource provides comprehensive information on how to conduct whale watching responsibly, minimising the impact on whales and their environment, thereby supporting the dual goals of education and conservation. The SOS provides no formal protection from tourism activities although the SC has been supportive and a significant contributor to international guidelines for sustainable whale watching, many of which have been adopted by Antarctic tour operations (see the IWC whale watching handbook (<https://wwhandbook.iwc.int/>) and IAATO cetacean guidelines: <https://iaato.org/download/ip072-guidelines-for-tourist-operations-in-antarctica/>).

### **Overview and summary**

Outside the Sanctuary, the threats largely mirror those within, though often with increased intensity and less regulatory oversight. International shipping, climate change, and fisheries interactions are particularly pronounced threats, as they are not confined by geographic boundaries. Pollution from land-based sources and plastic debris also has a far-reaching impact on whale populations even in the open oceans.

Specifically, we were asked to: *Assess the present and potential threats to whale populations and their habitats in the area of the Sanctuary and how the Sanctuary addresses this.* The SOS was principally developed and implemented to address the most significant threat facing whales at that time, which was whaling. The SOS has been effective in addressing this threat for all species and habitats within the SOS, while noting that Special Permit whaling is still technically possible within the SOS. While the SOS does not provide any formal protection from most of the other threats identified, it does provide a strong focus and justification for the advocacy and implementation of protection mechanisms for whale populations and their habitat through other international and national mechanisms (e.g., CCAMLR, IUCN, IMO, Antarctic Treaty). It is also important to note that, at least from our understanding, the SOS was not originally set up to specifically address any of these other threats and that both the Convention and the Schedule do not appear to contain specific mechanisms that could be used to address these threats. We also note that the Southern Ocean Sanctuary Management Plan, adopted by the Commission in 2018 (IWC, 2018; IWC/67/CC/06) provides updated and specific and measurable objectives, identifies research, implementation actions and performance measures many of which relate to potential threats to whale populations within the SOS region.

### **Consider whether the Sanctuary is consistent with other measures to protect whales from anthropogenic and other environmental factors**

The SOS, in conjunction with the adjoining IOS, provides comprehensive and full protection against commercial whaling activities by IWC member states. This measure directly contributes to the preservation of whale populations by eliminating potentially the most significant anthropogenic threat. The IWC is recognised internationally as the preeminent organisation for the management of whales and whaling and, therefore, it is the organisation that has the mandate to protect whale populations of the Southern Ocean. Without the combined protection afforded by the SOS and Moratorium on commercial whaling, it is possible that there could be whaling within the SOS. We caveat this with a note that only IWC member nations are formally bound by the requirements of the SOS, whereas non-member nations

are not. However, the formal implementation of the SOS provides an international tool through which member nations can exert influence and, potentially even specific pressure utilising domestic regulatory tools, over non-member nations. We suspect that this has been an effective tool in encouraging non-member nations to abide by the protections offered by the SOS.

Beyond the primary objective, the SOS's management plan proposes to enhance consistency with other measures to protect whales from anthropogenic and environmental factors, in alignment with International Conservation Agreements. However, we note that these have not been fully updated within the adopted management plan (IWC/67/CC/06). In addition, the alignment with other research and monitoring programs in the area overlapping with the SOS, particularly those conducted under the auspices of the Southern Ocean Research Partnership (IWC-SORP), contribute to understanding the impacts of climate change on marine ecosystems. This is through facilitating coordinated research on potential effects of environmental change on whale stocks. The SOS aligns with global scientific efforts to mitigate the impacts of climate change and ocean acidification on marine biodiversity.

Finally, as noted above, the SOS provides a strong focus and justification for the advocacy and implementation of protection mechanisms for whale populations and their habitat through other international and national mechanisms (e.g., CCAMLR, IUCN, IMO, UNCLOS, Antarctic Treaty). We note that many of these other international agreements and organisations refer directly to the SOS when considering wider, Southern Ocean ecosystem issues, and in our opinion, it is likely that the fact that the SOS exists provides positive impetus for other organisations to both consider and manage threats to whale populations other than whaling. Overall, the SOS is consistent with other measures to protect whales from anthropogenic and other environmental factors.

#### **Assess the effects of the Sanctuary in terms of the protection of whales in breeding areas, feeding grounds, and/or migratory routes**

The SOS, and adjacent IOS, provide complete protection from any existing or future commercial whaling by IWC member nations (and likely also indirectly from other non-IWC members as discussed above) for the populations of baleen whales that breed in the Indian Ocean. This includes their feeding and breeding grounds and also migratory routes. With respect to the remainder of the Southern Hemisphere, the SOS provides protection for Antarctic feeding grounds but there is no equivalent lower latitude protection afforded by an IWC Sanctuary although, we note that a South Atlantic Whale Sanctuary has been proposed previously. We also note that, in combination with the Moratorium on commercial whaling, complete protection is afforded to all Southern hemisphere whale populations throughout their range. If the Moratorium was ever amended or lifted, then the SOS would still provide complete protection from commercial whaling within its boundaries but in that instance, there would not be full protection throughout breeding grounds and migratory routes.

Although whaling has occurred in feeding areas under special permit in the past, the Working Group continues to assess that this activity has not occurred on a scale that would substantially undermine the objectives of the SOS. Furthermore, the Working Group has welcomed the thorough review and assessment process involved in the IUCN Important Marine Mammal Areas – IMMA (Tetley *et al.*, 2022), identifying a network of IMMAs across the continuous Southern Ocean, and that the tool has value for cetacean management and conservation, particularly regarding the assessment of protection of whales in breeding areas, feeding grounds, and/or migratory routes within and adjacent to the SOS. Such expert-identified areas further align with the proposed use of partial or sub-divided Sanctuary assessments recommended in the last SOS Review (IWC, 2017), contributing to an improved evaluation approach for monitoring of the SOS Management Plan objectives.

Obviously, the SOS is only effective in protecting whales' from the threat of commercial whaling without its boundaries and other mechanisms will be required to protect whale populations from other threats.

### **Assess the effects of the Sanctuary in terms of international agreements concerning biodiversity and conservation of nature**

The Agreement under the United Nations Convention on the Law of the Sea (UNCLOS) on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Agreement) was adopted on 19 June 2023 (Mendenhall *et al.*, 2023). The BBNJ Agreement becomes the third implementing agreement to the United Nations Convention on the Law of the Sea, with an overall objective for the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction for the present and in the long term. The BBNJ Agreement addresses four main issues: Marine genetic resources, including the fair and equitable sharing of benefits; Measures such as area-based management tools, including marine protected areas, environmental impact assessments, and capacity-building and the transfer of marine technology.

The Sanctuaries Working Group (IWC, 2023) has additionally noted the SOS is consistent with the objectives of International Agreements, and that continual effectiveness of the SOS and adjacent Sanctuaries may be enhanced by cooperation with other international organisations such as the UN Convention on Biological Diversity (CBD), Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), and the International Maritime Organisation (IMO).

Finally, as noted above, the SOS provides a strong focus and justification for the advocacy and implementation of protection mechanisms for whale populations and their habitat through other international and national mechanisms (e.g., CCAMLR, IUCN, IMO, UNCLOS, Antarctic Treaty). We note that many of these other international agreements and organisations refer directly to the SOS when considering wider, Southern Ocean ecosystem issues, and in our opinion, it is likely that the fact that the SOS exists provides positive impetus for other organisations to both consider and manage threats to whale populations other than whaling.

### **Evaluate whether the Sanctuary allows for the conduct of scientific research useful for meeting IWC objectives or coordinated integrated research and monitoring programmes across the range of issues of global relevance**

The SOS serves as a pivotal platform for conducting scientific research that aligns with the IWC objectives and contributes to global marine conservation efforts. The development of the SOS Reporting proforma, as detailed in the 2023 Sanctuaries Working Group underscores the sanctuary's commitment to facilitating comprehensive and systematic research endeavours. This initiative has enabled the collation of significant data on whale populations, their habitats, and the broader Antarctic marine ecosystem, thereby supporting the IWC's scientific and conservation mandates.

The Southern Ocean Research Partnership (SORP) is an international collaborative initiative aimed at promoting non-lethal research methodologies to enhance our understanding of the marine ecosystems in the Southern Ocean, particularly focusing on whale populations. SORP benefits the scientific community and conservation efforts by facilitating the sharing of resources, data, and methodologies among participating countries. This approach not only increases the efficiency of research efforts but also reduces the overall impact on the studied whale populations by relying on non-invasive techniques. Moreover, the insights gained from SORP's research are vital for informing conservation policies and management strategies, helping to ensure the protection of marine biodiversity and the sustainable management of

the Southern Ocean's natural resources. Through initiatives such as the SORP and collaborations with international bodies like the CCAMLR, and the Scientific Committee on Antarctic Research (SCAR), the SOS has enhanced the coordination of research and monitoring programs. These efforts focus on a range of globally relevant issues, including the impacts of climate change on marine ecosystems, the conservation of marine biodiversity, and the assessment of anthropogenic threats to marine species.

The structured approach to data collection and analysis facilitated by the SOS has been instrumental in advancing our understanding of marine ecosystems and the factors influencing whale populations. This scientific foundation is crucial for the IWC to make informed decisions and implement effective conservation strategies. We also note that the management plan of the SOS provides some useful and tangible direction for research and coordination, specifically the Research and Action Plan.

To further enhance the sanctuary's contribution to scientific research the IWC should: encourage greater participation in the SOS's scientific endeavours from a broader range of international research institutions and conservation organisations; utilise advanced technologies and methodologies for monitoring marine ecosystems; and assessing the impacts of environmental changes on whale populations.

#### **Provide advice on whether the sanctuary is consistent with the precautionary principle**

The SOS's establishment and ongoing management are inherently aligned with the precautionary principle that advocates for proactive conservation measures in the face of uncertainty. Defined by principle 15 of the Rio Declaration on Environment and Development in 1992: 'where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation'. By prohibiting commercial whaling within its boundaries and focusing on the restoration and protection of whale populations and their habitats, the sanctuary embodies the essence of precautionary management principles. This approach is further evidenced by the sanctuary's adaptability to emerging scientific knowledge and environmental challenges, ensuring that conservation measures are responsive to new insights and global environmental changes.

The integration of Important Marine Mammal Areas (IMMAs) into the Sanctuary's conservation framework exemplifies the application of the precautionary principle, identifying and protecting critical habitats based on the best available science. Moreover, the Sanctuary's alignment with international conservation agreements, such as the BBNJ Agreement, reinforces its commitment to precautionary principles by promoting management and protection of marine biodiversity beyond national jurisdictions. The IWC should continually update conservation strategies based on the latest scientific findings and environmental assessments, ensuring that the sanctuary remains a robust protective measure for marine biodiversity aligned with other existing agreements and expert-based initiatives.

While not explicitly referring to the precautionary principle, the SOS Management Plan includes elements of it both in the objectives and the associated research and action plan.

#### **CONCLUSIONS**

Overall, our review of the SOS against the stated criteria were generally favourably. One important caveat is that it is important to note that, at least from our understanding, the SOS was not originally set up to specifically address threats other than commercial whaling and that both the Convention and the Schedule do not appear to contain specific mechanisms that could be used to address threats other than this. Notwithstanding this potential limitation, significant progress has been made in a range of different areas, generally through close collaborations with other organisations.

We were specifically requested to review the SOS against six criteria:

1. *Assess the present and potential threats to whale populations and their habitats in the area of the SOS and how the Sanctuary addresses this.*

The SOS has been effective in addressing the threat of commercial whaling for all species and habitats within the SOS, while noting that Special Permit whaling is still technically possible within the SOS. While the SOS does not provide any formal protection from most of the other threats identified, it does provide a strong focus and justification for the advocacy and implementation of protection mechanisms for whale populations and their habitat through other international and national mechanisms (e.g., CCAMLR, IUCN, IMO, Antarctic Treaty). Through these collaborations, the IWC has been successful in advocating for and supporting the implementation of a wide range of measures to protect whales from a variety of threats within the SOS.

2. *Consider whether the Sanctuary is consistent with other measures to protect whales from anthropogenic and other environmental factors.*

The SOS, in conjunction with the adjoining IOS, provides comprehensive and full protection against commercial whaling activities by IWC member states. This measure directly contributes to the preservation of whale populations by eliminating potentially the most significant anthropogenic threat. We note that many other international agreements and organisations refer directly to the SOS when considering wider, Southern Ocean ecosystem issues, and in our opinion, it is likely that the fact that the SOS exists provides positive impetus for other organisations to both consider and manage threats to whale populations other than whaling. Overall, the SOS is consistent with other measures to protect whales from anthropogenic and other environmental factors.

3. *Assess the effects of the Sanctuary in terms of the protection of whales in breeding areas, feeding grounds, and/or migratory routes.*

The SOS, and adjacent IOS, provide complete protection from any existing or future commercial whaling by IWC member nations (and likely also indirectly from other non-IWC members as discussed above) for the populations of baleen whales that breed in the Indian Ocean. This includes their feeding and breeding grounds and also migratory routes. With respect to the remainder of the Southern Hemisphere, the SOS provides protection for Antarctic feeding grounds but there is no equivalent lower latitude protection afforded by an IWC Sanctuary although, we note that a South Atlantic Whale Sanctuary has been proposed previously.

4. *Assess the effects of the Sanctuary in terms of international agreements concerning biodiversity and conservation of nature.*

The SOS provides a strong focus and justification for the advocacy and implementation of protection mechanisms for whale populations and their habitat through other international and national mechanisms (e.g., CCAMLR, IUCN, IMO, UNCLOS, Antarctic Treaty). We note that many of these other international agreements and organisations refer directly to the SOS when considering wider, Southern Ocean ecosystem issues, and in our opinion, it is likely that the fact that the SOS exists provides positive impetus for other organisations to both consider and manage threats to whale populations other than whaling.

5. *Evaluate whether the Sanctuary allows for the conduct of scientific research useful for meeting IWC objectives or coordinated integrated research and monitoring programmes across the range of issues of global relevance.*

The SOS serves as a pivotal platform for conducting scientific research that aligns with the IWC objectives and contributes to global marine conservation efforts. The development of the SOS Reporting proforma, as detailed in the 2023 Sanctuaries Working Group, underscores the sanctuary's commitment to facilitating comprehensive and systematic research endeavours. This initiative has enabled the collation of significant data on whale populations, their habitats, and the broader Antarctic marine ecosystem, thereby supporting the IWC's scientific and conservation mandates.

6. *Provide advice on whether the sanctuary is consistent with the precautionary principle.*

The SOS's establishment and ongoing management are inherently aligned with the precautionary principle that advocates for proactive conservation measures in the face of uncertainty. While not explicitly referring to the precautionary principle, the SOS Management Plan includes elements of it both in the objectives and the associated research and action plan.

The 2018 draft of the SOS Management Plan (IWC/67/CC/06) is structured around measurable goals that address direct and indirect threats to cetaceans within the sanctuary. This includes collaboration with international bodies like the International Maritime Organization (IMO) and the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) to manage threats from ship strikes, entanglements, and environmental changes affecting krill populations, a primary food source for many whales.

The 2017 review led to recommendations for clearer performance measures linked to the sanctuary's objectives, which have been incorporated into the current management plan. These measures are designed to monitor the effectiveness of the sanctuary in achieving its conservation goals, including the stability and growth of whale populations and the health of the broader marine ecosystem.

This third review (2024) suggests further refinement of the sanctuary's objectives could be made to address emerging environmental challenges like climate change and increased human activities in the Southern Ocean, including further alignment with the recent UNCLOS Biodiversity Beyond National Jurisdiction (BBNJ) agreement. These broadly include:

1. Refinement of conservation objectives, adjusting the SOS objectives to address current and future conservation challenges effectively;
2. Performance measures and monitoring, to develop robust, quantifiable performance measures and adaptive monitoring programs to reflect changing environmental conditions;
3. Systematic research and collaboration, enhancing the integration of ongoing research efforts and promoting international collaboration to address the impacts of environmental and anthropogenic pressures; and
4. Continual management plan development with regular updates to incorporate the latest scientific insights and conservation strategies, ensuring the plan remains relevant and effective.

Looking forward, the SOS management plan emphasises the importance of adaptive management strategies that can respond dynamically to new scientific data and environmental changes. This approach is crucial in maintaining the sanctuary's relevance and effectiveness as a conservation tool. The plan also underscores the necessity of enhancing international cooperation and integration with other global conservation measures to ensure a coordinated approach to marine biodiversity conservation.

In conclusion, the Southern Ocean Sanctuary (SOS) Draft Management Plan serves as a critical framework for the conservation of whale populations and the broader marine ecosystem in the Southern Ocean.

However, the SOS can only be effective through continued evaluation against and in alignment with other legal instruments and international agreements allowing for effective and enforceable management measures. This includes agreements either overlapping the SOS area (i.e., CCAMLR), the species of relevance to the SOS aims (i.e., BBNJ, CBD), or the competent authorities regulating human activities (i.e., IMO, ISA), to fulfil its role as an effective conservation tool and sanctuary providing refuge and recovery for marine mammals and supporting marine biodiversity.

Table 2  
Review of Recommendations from the first and second decadal review of the SOS with potential new recommendations for the third review

Recommendations (2004)	Recommendations (2016)	New potential recommendations (2024)
(i) Better articulate the purpose(s) of the Sanctuaries with refined objectives, including the relationship between the RMP and Sanctuary programmes.	(i) Each SOS objective should be linked to an appropriate performance measure.	(i) <i>Refinement and Articulation of Sanctuary Objectives:</i> (a) Develop and clarify the specific conservation objectives of the SOS in light of emerging environmental challenges such as climate change and increased human activities; and (b) Ensure that these objectives are clearly articulated and integrated with IWC management strategies to ensure comprehensive protection.
(ii) Develop appropriate performance measures linking the objectives of a Sanctuary with field monitoring programmes.	(ii) Develop appropriate performance measures for the SOS, potentially drawing on existing mechanisms like the In-Depth assessment process.	(ii) <i>Performance Measures and Monitoring Strategy:</i> (a) Establish clear, quantifiable performance measures for each objective of the SOS. These should be linked to updated and adaptive monitoring programs that reflect the dynamic environmental and ecological conditions within the sanctuary.
(iii) Establish or further develop systematic inventory and research programmes to build the required information base for a Sanctuary management plan and subsequent monitoring programmes.	(iii) Incorporate outputs from existing and planned research programmes into the development of a management plan for the SOS and subsequent monitoring programmes.	(iii) <i>Systematic Research and Inventory Programs:</i> (a) Continue to build and update a comprehensive inventory of research and monitoring programs that contribute to the management of the SOS; and (b) Encourage international collaboration in research initiatives, especially those focusing on the impacts of climate change and anthropogenic pressures on whale populations within the sanctuary.
(iv) A Sanctuary management plan should clearly outline broad strategies and specific actions needed to achieve Sanctuary objectives.	(iv) Develop a management plan for the SOS to clearly outline the broad strategies and specific actions needed to achieve Sanctuary objectives.	(iv) <i>Development and Periodic Review of the Management Plan:</i> (a) Develop the management plan for the SOS, updating the existing plan to align with the latest scientific research and conservation priorities; and (b) Ensure that the management plan includes specific actions and strategies that are needed to achieve the sanctuary's objectives, incorporating adaptive management strategies to respond to new scientific information and environmental changes.
(v) Undertake a monitoring strategy that measures progress toward achieving the Sanctuary objectives, including developing tangible indicators to monitor progress.	(v) Review criteria should be linked to performance measures and reflect the goals and objectives of the SOS, based on the 2014 Terms of Reference.	(v) <i>Establishment of Review Criteria and Performance Indicators:</i> (a) Define clear criteria for periodic reviews of the SOS to ensure that its management remains effective and relevant. These criteria should be linked to the performance measures and should reflect the goals and objectives of the sanctuary; and (b) Develop tangible indicators for monitoring progress toward meeting the sanctuary objectives, including ecological and conservation benchmarks.



<p>(vi) Establish review criteria that reflect the goals and objectives of the Sanctuary.</p>	<p>(iv) Once a management plan is developed, it should be refined periodically to account for ecological, oceanographic, and other changes in an adaptive fashion.</p>	<p>(vi) <i>Enhanced Integration with International Agreements and Conservation Measures:</i> (a) Assess and enhance the alignment of the SOS with other international measures for marine conservation, such as the BBNJ Agreement, to ensure consistent and complementary management approaches; and (b) Strengthen collaborations with global and regional conservation bodies, such as the IUCN, Convention on Biological Diversity (CBD) and the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), to synergize efforts in marine biodiversity conservation.</p>
<p>(vii) Refine the Sanctuary management plan periodically to account for ecological, oceanographic, and other changes in an adaptive fashion.</p>		<p>(vii) <i>Scientific Research and Global Relevance:</i> (a) Promote the SOS as a platform for conducting globally relevant scientific research that helps in understanding the broader impacts of environmental changes on marine ecosystems. Encourage the submission of studies and findings that could influence global marine conservation policies and practices, ensuring that the SOS contributes significantly to global efforts in marine biodiversity conservation.</p>
		<p>(viii) <i>Consistency with the Precautionary Principle:</i> (a) Continuously evaluate and ensure that the management of the SOS is consistent with the precautionary principle, advocating for proactive measures in the face of scientific uncertainty; and (b) Update the sanctuary's strategies based on the latest scientific insights and environmental assessments, ensuring robust protective measures for marine biodiversity.</p>

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