

# Antarctic Region

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# 1 About

## 1.1 Overview

Antarctica is surrounded by a vast, unbroken and dynamic body of water known as the Southern Ocean, which constitutes about 15% of the world's total ocean surface. It is the only continent on Earth to be completely governed by its very own international agreement. Antarctica's resources have been harvested for about 200 years. In many cases the intense level of exploitation has resulted in the severe depletion of harvested stocks, as was the case for fur and elephant seals in the 19th century, and whales and finfish in the 20th century. The resulting concern for the health of Antarctic ecosystems and its extraordinary marine and terrestrial life has kept environmental issues at the forefront ever since the Antarctic Treaty was adopted.

The Treaty was signed in 1959 by the 12 nations present in Antarctica at that time, and a further 31 nations signed the Treaty after it came into force in 1961. It is still open to any member of the United Nations. Concerns raised in the mid-1970s that an increase in krill catches in the Southern Ocean could have a serious effect on populations of krill and other marine life; particularly on birds, seals and fish which depend on krill for food lead to the adoption of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The Convention came into force in 1982 and defines a Commission and a Scientific Committee to work together to manage marine living resources in the Southern Ocean.

In 1991 of the Protocol on Environmental Protection to the Antarctic Treaty was signed, which, *inter alia*, establishes the Committee for Environmental Protection (CEP). The Protocol entered into force on 14 January 1998 and is aimed at ensuring the continued health of the Antarctic environment as a whole.

In contrast to other multilateral fisheries conventions, CCAMLR is concerned not only with the regulation of fishing, but also has a mandate to conserve the ecosystem. This 'ecosystem approach', which considers the whole Southern Ocean to be a suite of interlinked systems, entails managing the resource while avoiding adverse effect on 'dependent and related species' and considering the status and health of the ecosystem. Key CCAMLR initiatives include the monitoring of marine debris and its impact on marine animals including seals and seabirds, the CCAMLR Ecosystem Monitoring Programme (CEMP), and reduction of seabird by-catch in fisheries.

The Antarctic is mostly a pristine environment with remarkable marine life and abundant natural resources. Antarctica's unique nature means that environmental protection plays a central role in this particular Regional Seas Programme.

## 1.2 Key Dates

1959	The Antarctic Treaty was signed.
1961	The Antarctic Treaty came into force on 23 June 1961. First Consultative Meeting in Canberra.
1972	Convention for the Conservation of Antarctic Seals signed
1978	Convention for the Conservation of Antarctic Seals entered into force on 11 March 1978
1977	Antarctic Treaty Consultative Meeting commenced a series of international negotiations on marine living resources conservation.
1980	Convention on the Conservation of Antarctic Living Marine Resources (CCAMLR)
1982	The Convention entered into force on 7 April 1982
1991	The Protocol on Environmental Protection to the Antarctic Treaty was signed.
2002	The Protocol entered into full force with the entry into force of Annex V on 24 May 2002

## 1.3 Geographic and General Information

**Region:** Antarctic

**CCAMLR Participating States:** Argentina, Namibia, Australia, New Zealand, Belgium, Norway, Brazil, Poland, Chile, Russia, European Community, South Africa, France, Spain, Germany, Sweden, India, Ukraine, India, Italy, United Kingdom, Japan, United States of America, Republic of Korea, Uruguay, Bulgaria, Greece, Canada, Netherlands, Finland, Peru and Vanuatu (CCAMLR 2004)

**Total Population:** no indigenous inhabitants (CIA 2004)

**Length of Coastline:** 17,968 km (CIA 2004)

**Area:** approximately 35 million km<sup>2</sup> (CCAMLR 2004)

**Large Marine Ecosystems:** LME #61: Antarctic

**GIWA Region:** Subregion 66: Antarctic

### 1.3.1 Oceanographic Information

The Antarctic Circumpolar Current (ACC) is the primary means by which water is exchanged between the Pacific, Indian and Atlantic ocean basins. The ACC therefore plays a key role in global thermohaline circulation and the redistribution of heat and other properties. The most important barrier for the Antarctic is the Antarctic Convergence (often termed the “Polar Front”), the major oceanographic and biogeographic boundary that separates the Antarctic environment from that of the rest of the world. This has an average position at about 50-55°S. A second major oceanographic feature is the Antarctic Divergence, close to Antarctica at about 65°S. (Deacon 1984)

The Southern Ocean is a source of intermediate and deep water masses that ventilate the world ocean. It surrounds the continent of Antarctica and is clearly delimited by the Antarctic Convergence. The Antarctic Convergence acts as an effective biological barrier, and the Southern Ocean is therefore substantially a closed ecosystem. At the Convergence, cool relatively low salinity (due to input from melting ice) Antarctic surface waters sink below the warmer high salinity waters to the north. The resulting Antarctic Intermediate waters flow northwards in each of the ocean basins. The densest water in the oceans, Antarctic Bottom Water, is formed during winter when salt rejection occurs during the formation of sea-ice. This water spreads northward through all of the deepest basins of the world's oceans. The formation and sinking of these water masses results in a significant exchange of heat, fresh water and gases such as carbon dioxide between the ocean and the atmosphere. Understanding the circulation and water mass formation mechanisms in the Southern Ocean is therefore critical to the development of models capable of predicting the timing and magnitude of future climatic change. Upwelling at the divergence introduces into the surface layer an abundance of nutrients that are the basis for the great phytoplankton growth during spring and summer (Dingwell 1995).

The continent of Antarctica covers some 14 million km<sup>2</sup> and, in summer the continental area is augmented by 3 million km<sup>2</sup> of sea-ice in the form of ice shelves and multiyear ice. In winter, the area covered by ice increases to some 20 million km<sup>2</sup>, effectively doubling the area of the Southern Hemisphere covered by ice. Formation of the additional 17 million km<sup>2</sup> has many effects. The ice acts as an insulating barrier between warm water below (-1.8°C) and cold air (-20°C to -30°C) above. The ice is thus important in controlling the heat flux between the ocean and atmosphere with the impact that can have on Southern Hemisphere weather. The freezing of the sea surface to form sea-ice generates a residue of high salinity, high density, cold water that sinks (thermohaline circulation) to form Antarctic Bottom Water that is a product of a process that forms half of the world's water masses, some detectable as far north as the North Atlantic. This product takes with it oxygen, dissolved carbon dioxide and other gases. South of the Antarctic Divergence, water temperatures in summer reach 0°C, but during winter they are at the freezing point of sea water, 1.8°C. Between the Divergence and the Convergence, water temperature increases northwards to 4-5°C at the Convergence where it increases about 2-3°C over a short distance (Dingwell 1995).

For further information refer to: Deacon, G.E.R. (1984) *The Antarctic Circumpolar Ocean* by G.E.R. Deacon, published in 1984 by Cambridge University Press, 180 pp.

### **1.3.2 Coastal Geography and Geology**

The Southern Ocean consists of a system of deep basins separated by three large mid-oceanic ridges: the Macquarie Ridge south of New Zealand and Tasmania; the Kerguelen–Gaussberg Ridge; and the Scotia Ridge, or Scotia Arc, extending from the southern Patagonian shelf in an eastward arc to the South Shetland Islands and the Antarctic Peninsula. The continental shelf is narrow, except in parts of the Weddell, Ross, Amundsen and Bellingshausen Seas. It accounts for only 3-5% of the total area of the Southern Ocean (CCAMLR 2004a).

The continental margin of the continent of Antarctica is about 20,000 km long. The continental shelf is anomalously deep averaging 460 m deep. In many areas the shelf deepens from shelf edge to continent and deep trenches are common around the margin, some as deep as 1,200-1,500 m, and normally parallel to the coast and

shelf edge. Some of these "deeps" are closed but most open to the deep sea through submarine canyons. The shelf can be divided into two types: those facing the ocean and those on major embayments (Ross Sea, Weddell Sea, Prydz Bay). The former generally appear narrow, normally about 150 km. The latter are generally covered, to a significant extent, with permanent ice shelves (Ross, Filchner-Ronne, Amery). The Antarctic Peninsula margin is more dissected by canyons and trenches (e.g. South Shetland Trench). The continental margin is generally surrounded by broad gentle abyssal plains (Dingwell 1995).

For further information refer to :Deacon, G.E.R. (1984) The Antarctic Circumpolar Ocean by G.E.R. Deacon, published in 1984 by Cambridge University Press, 180 pp.

### **1.3.3 Ecosystem Diversity**

The Antarctic consists of concentric rings of interconnected ecosystems that move seasonally with the advance and retreat of the pack ice. There are oceanic, neritic and intermediate regimes as well as a well-defined communities associated with the pack ice and marginal ice edge zone.

For further information on the ecosystem diversity in the Antarctic refer to:  
Everson, I. (ed), "Krill: Biology, Ecology and Fisheries", Blackwell Science 372pp. 2000;  
El-Sayed, S.Z. (ed). "Southern Ocean Ecology: The BIOMASS Perspective", Cambridge University Press, 399pp. 1994.

#### **1.3.3.1 Sea Ice**

There is a rich and complex food web within the ice itself, which is receiving considerable attention. It includes microscopic organisms that live in such habitats as brine channels, under the ice and attached to ice floes (Dingwell 1995).

Three major ecological zones can be distinguished in the Southern Ocean. The Ice-free Zone lies between the Antarctic Polar Front and the northern limit of the pack-ice in winter. The intermediate Seasonal Pack-ice Zone lies between the northern limits of the pack-ice in winter–spring and in summer–autumn. The High-latitude Antarctic Zone, or Permanent Ice Zone, is adjacent to the Antarctic continent. The most productive of the three zones is the Seasonal Pack-ice Zone, where krill (*Euphausia superba*) is the dominant planktonic organism and the staple food of many whales, seals, birds and fish (CCAMLR 2004a).

Life in the pack ice zone undergoes an intense short period of high productivity and because of the special characteristics of the environment, there is a specialised biota. Primary productivity provides food for pelagic suspension feeders and a considerable amount makes its way to the seafloor where it is consumed by such benthic filter-feeders as sponges (Dingwell 1995).

#### **1.3.3.2 Deep Sea**

The Southern Ocean consists of a system of deep basins separated by three large mid-oceanic ridges: the Macquarie Ridge south of New Zealand and Tasmania; the Kerguelen–Gaussberg Ridge; and the Scotia Ridge, or Scotia Arc, extending from the southern Patagonian shelf in an eastward arc to the South Shetland Islands and the Antarctic Peninsula (CCAMLR 2004a). The continental shelf of Antarctica is

deep and in many areas forms deep trenches (e.g. South Shetland Trench), some as deep as 1,200-1,500 m. Some of these "deeps" are closed but most open to the deep sea through submarine canyons (Dingwell 1995).

### **1.3.4 Species Diversity**

For further information the species diversity in the Antarctic refer to:  
Everson, I. (ed), "Krill: Biology, Ecology and Fisheries", Blackwell Science 372pp. 2000;  
El-Sayed, S.Z. (ed). "Southern Ocean Ecology: The BIOMASS Perspective", Cambridge University Press, 399pp. 1994.

#### **1.3.4.1 Krill**

Krill has a circumpolar distribution in the Southern Ocean. The neritic or inshore community is characterized by the presence of a small species of krill (*Euphausia crystallophias*) that are important in the diet of many fishes and some land-based vertebrates, especially in embayments such as the Ross Sea and in Prydz Bay. Towards the shelf break in midsummer is found the more familiar "krill based ecosystem" in which the large Antarctic krill (*Euphausia superba*) dominates, often to the exclusion of other pelagic invertebrates. This zone of dominance probably tracks the ice edge occurring offshore of the retreating pack ice in spring. The relationship between Antarctic krill and the ice edge in autumn and winter is less certain, but krill are known to occur under the ice in winter though how far they extend into the pack is unknown. This zone is where the highest primary productivity occurs and is also the feeding area for many of the Antarctic vertebrates, in particular the whales, seals and seabirds. The deep water, oceanic zone is more typical of oligotrophic oceans worldwide, dominated by species of zooplankton, such as salps, copepods and chaetognaths. Antarctic krill does, however, occur in extremely high abundances right around the continent. Current estimates of the standing stock of *Euphausia superba* are of the order of 500 million tons and its central role in the Antarctic ecosystem (Dingwell 1995). Benthos

Benthic communities have a great variety and abundance of animals and plants, including a high proportion of species endemic to the Antarctic Marine Region. Standing crop in the shallow sub-littoral increases as the effect of ice scour decreases, before declining again in the deeper parts of the shelf (Dingwell 1995).

#### **1.3.4.2 Fish and Shellfish**

There are about 270 species of fish, the most abundant and important species belong to the sub-order Notothenioidei (Dingwell 1995). Fish species of commonly fished include marbled rockcod (*Notothenia rossii*), mackerel icefish (*Champsocephalus gunnari*), grey rockcod (*Lepidonotothen squamifrons*), Patagonian rockcod (*Patagonotothen guntheri*), sub-Antarctic lanternfish (*Electrona carlsbergi*) and Wilson's icefish (*Chaenodraco wilsoni*), humped rockcod (*Gobionotothen gibberifrons*), various icefish species (e.g. *Champsocephalus gunnari*), skates (*Raja georgiana*, *Bathyraja* spp.) and toothfish (*Dissostichus eleginoides* (Patagonian toothfish), which is generally found in waters north of 60°S, and *Dissostichus mawsoni* (Antarctic toothfish), which is generally found south of 60°S). Two species of stone crabs (Lithodidae) are found in waters around South

Georgia and Shag Rocks, *Paralomis spinosissima* and *P. Formosa*. Large populations of squid (e.g. *Martialia hyadesi*) are probably predators of krill (Kock 1992).

#### **1.3.4.3 Birds**

The Antarctic bird fauna consists of some 40 species, of which the penguins are the best known and most important in the ecosystem. They consume an estimated 130 million tons of krill per year. Birds are key consumers of krill and are the group most likely to be adversely affected by a marked increase in fishery on krill. Penguins make up 90 % of the avian biomass and utilize about 90 % of the food consumed by birds (Dingwell 1995). Species of penguins found in the region include Adélie penguin (*Pygoscelis adeliae*); chinstrap penguin (*Pygoscelis Antarctica*); gentoo penguin (*Pygoscelis papua*), King penguins (*Aptenodytes patagonicus*), crested penguins (*Eudyptes* spp.) and macaroni penguin (*macaroni penguin*) The largest populations of king penguins are at the Crozet Islands (700 000 pairs), South Georgia (400 000 pairs) and Macquarie Island (110 000 pairs). Other than penguins, the bird fauna is dominated by petrels and albatrosses (wandering albatross (*Diomedea exulans*); black-browed albatross (*Diomedea melanophrys*)). Other bird species include Antarctic petrel (*Thalassoica Antarctica*) and Cape petrel (*Daption capense*) (Dingwell 1995, CCAMLR 2004).

#### **1.3.4.4 Marine Mammals**

Crabeater (*Lobodon carcinophagus*) and leopard seals (*Hydrurga leptonyx*) inhabit the ice edge and the area marginal to it. The crabeater seal is a major consumer of krill and may have increased its population dramatically because of the krill made available by the marked reduction of whale numbers. Leopard seals are much less discriminatory in food source and consume virtually anything available. Ross (*Ommatophoca rossii*) and Weddell seals (*Leptonychotes weddellii*) also inhabit the pack ice zone. Weddell seals consume fish, squid and benthos, while the Ross seal diet is poorly known but squid is known to be a constituent. Antarctic fur seal (*Arctocephalus gazella*) and elephant seals (*Mirounga leonina*) breed on Subantarctic islands (Dingwell 1995). There are now more than 2 million Antarctic fur seals. Much smaller populations of fur seals, numbering several hundred to some tens of thousands of animals, occur in the South Shetland, South Orkney and South Sandwich Islands and Bouvet, Marion, Kerguelen, Heard, McDonald and Macquarie Islands. All populations are increasing, some of them rapidly. Populations of fur seals in the Atlantic Ocean sector are believed to have originated from South Georgia.. The large breeding colonies of elephant seals occur at South Georgia, the Kerguelen Islands, Heard, McDonald and Macquarie Islands (CCAMLR 2004).

Species of whales found in the region include the sperm (*Physeter macrocephalus*), minke (*B. acutorostrata*), southern bottlenose whales (*Hyperoodon planifrons*), humpback whales (*Megaptera novaeangliae*) blue whales (*Balaenoptera musculus*), fin whales (*B. physalus*), sei (*B. borealis*) and killer whales (*Orcinus orca*). Commercial exploitation led to the marked decrease in the numbers of large whales. The Minke whale, which is now estimated to have a population of some 760,000 individuals in Antarctic waters, is the only baleen whale that is present in large numbers. Whales migrate in and out of the Antarctic, and migrate within the Antarctic following the ice edge and their food supply. The Antarctic journey of the baleen whales allows them to build up their blubber reserves before moving to the tropics to breed in winter (Dingwell 1995). An estimated 600 000 beaked whales in the



Southern Ocean (primarily southern bottlenose whales) are supported by large populations of squid (CCAMLR 2004).

### 1.3.5 Information on Antarctica

**Total Population:** no indigenous inhabitants (there are both permanent and summer-only staffed research stations) (CIA 2004)

**Maritime Claims:** The Convention area (CCAMLR) applies to the Antarctic marine living resources of the area south of 60° South latitude and to the Antarctic marine living resources of the area between that latitude and the Antarctic Convergence which form part of the Antarctic marine ecosystem (CCAMLR 2004).

**Length of Coastline:** 17,968 km (CIA 2004)

**Marine Protected Areas:**

- Dion Island, Marguirite Bay
- North Coronation Island, South Orkney Islands
- Southern Powell Island and adjacent islands, South Orkney Islands

**Site of Special Scientific Interest**

Five of the SSSIs are entirely marine protected areas:

- Chile Bay, South Shetland Islands SSSI No. 26: Protects two small separate tracts of benthic habitat, one at depths of 50-100 m, the other at depths of 100-200 m.
- Port Foster, South Shetland Islands SSSI No. 27: Two small separate tracts of benthic habitat within a sea-filled volcanic caldera, one at depths of 50-150 m the other at 100-150 m depth.
- South Bay Palmer Archipelago SSSI No. 28: A 115 hectare area of embayment plus adjacent littoral zone, protecting coastal and sub-littoral benthos to 45 m depth.
- Western Bransfield Strait. South Shetland Islands SSSI No. 34: Benthos-rich sea floor area to 200 m depth, including a small area of adjacent land and foreshore.
- East Dallmann Bay Palmer Archipelago SSSI No. 35: Benthos-rich sea floor down to 200 m depth.

The following SSSIs also include a marine component:

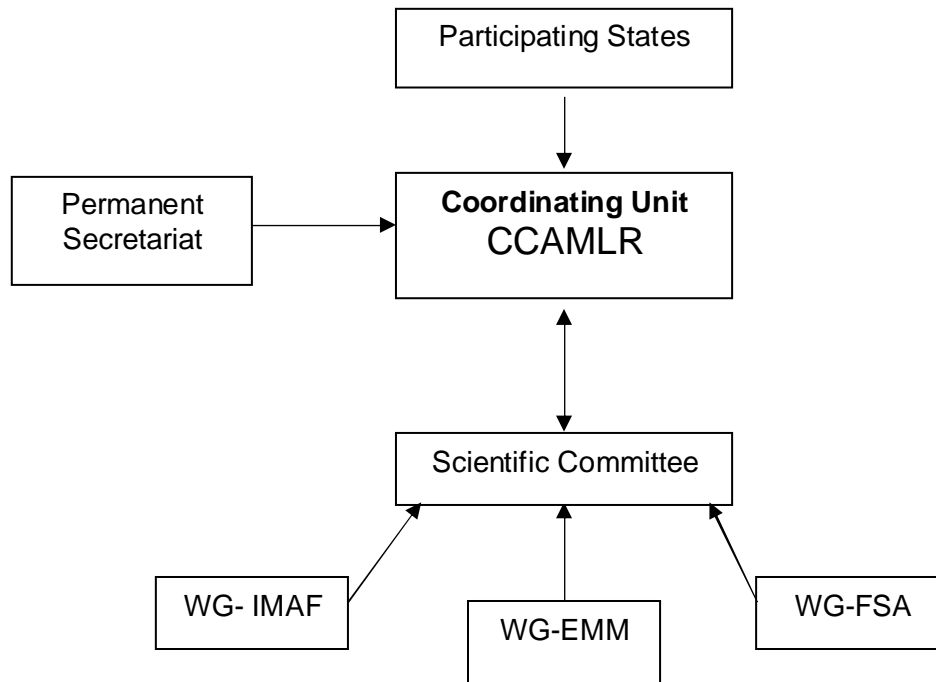
- Ardley Island, South Shetland Islands, SSSI No. 32.
- Biscoe Point, Anvers Islands, SSSI No. 20.
- Cape Crozier, Ross Islands, SSSI No. 4
- Cape Royds, Ross Islands, SSSI No. 1
- Harmony Point, South Shetland Islands, SSSI No. 14.
- Lions Rump, South Shetland Islands, SSSI No. 33
- North-West White Islands, McMurdo Sound, SSSI No. 18.
- Yujidori Valley, Lutzow-Holm Bay SSSI No. 22.

**Seal Reserves**

Three oceanic areas are reserves, within which it is forbidden to take seals. These have a combined area of 190,000 km<sup>2</sup>.  
(Dingwell 1995)

## 1.4 Organization

### 1.4.1 Institutional Structure



CCAMLR: The Commission for the Conservation of Antarctic Marine Living Resources

WG-EMM: Working Group on Ecosystem Monitoring and Management

WG-FSA: Working Group on Fish Stock Assessment

WG- IMAF Ad hoc Working Group on Incidental Mortality Associated with Fishing

### 1.4.2 Coordinating Unit

The Commission for the Conservation of Antarctic Marine Living Resources was established under Article IX of the Convention. The Convention's objectives and principles are set out in Article II. In balancing the conservation of Antarctic marine living resources and their rational use, the Commission has been in the forefront of organisations in the development of an ecosystem approach to managing such resources.

The Commission is the decision making body and is supported by the Scientific Committee providing scientific advice the permanent Secretariat, which provides administrative support for the Commission and Scientific Committee. All Parties to CCAMLR are entitled to be Members of the Commission, which oversees the implementation of the Convention. Commission Members pay a financial contribution and are able to take part in the making of decisions. All decisions are by consensus in accordance with Article XII. The Commission sets policy on, and regulates, activities associated with the rational utilisation and management of marine living resources in the Southern Ocean. It receives advice from its Scientific Committee (SC-CAMLR), which in turn bases this on assessments undertaken by its Working

Group on Ecosystem Monitoring and Management (WG-EMM) and the Working Group on Fish Stock Assessment (WG-FSA).

Each Member of the Commission is involved in fishing and/or scientific research in the Southern Ocean. These activities are coordinated and regulated by the Commission and Scientific Committee to fulfill Members' obligations under the Convention. The enforcement of management measures is the legal responsibility of individual Members, but the Commission, through various publications and decisions, aims to encourage compliance with its measures (CCAMLR 2004).

The members of the Commission are: Argentina, Namibia, Australia, New Zealand, Belgium, Norway, Brazil, Poland, Chile, Russia, European Community, South Africa, France, Spain, Germany, Sweden, India, Ukraine, India, Italy, United Kingdom, Japan, United States of America, Republic of Korea and Uruguay. States party to the Convention but not Members of the Commission: Bulgaria, Greece, Canada, Netherlands, Finland, Peru and Vanuatu (i.e. these seven States do not take part in decision making, but are bound by the Convention). For Member Contacts link to: <http://www.ccamlr.org/pu/E/ms/contacts.htm> For a current briefing on the stance of the Commission and Scientific Committee link to: <http://www.ccamlr.org/pu/E/pubs/am/man-ant/toc.htm> and/or <http://www.ccamlr.org/pu/E/pubs/am/toc.htm>.

**Contacts:**

PO Box 213

North Hobart 7002

Tasmania

Australia

Tel: +61 3 6231 0366

Fax: +61-3-623479965

Email: [ccamlr@ccamlr.org](mailto:ccamlr@ccamlr.org).

**Website:** <http://www.ccamlr.org>.

**Last Meeting:**

Commission - CCAMLR-XXIII, 25 October to 5 November 2004, Hobart, Australia

### 1.4.3 Secretariat

The permanent Secretariat provides administrative support for the Commission and Scientific Committee. An interim agreement between the Commission for the Conservation of Antarctic Marine Living Resources and the Government of Australia was drawn up at Canberra on 20 May 1980. A full agreement entered into force in 1984 and this clearly outlines the conditions attached to locating the headquarters of the Commission in Australia in accordance with Convention Article XIII (CCAMLR 2004). For further information link to: <http://www.ccamlr.org/pu/e/cc/sec/intro.htm>

**Contacts:** Dr Denzil G.M. Miller,  
Executive Secretary, CCAMLR Secretariat  
137 Harrington Street, North Hobart,  
Tasmania, Australia

#### **1.4.4 Scientific Committee**

All Members of the Commission are also Members of the Scientific Committee. The Scientific Committee (SC-CAMLR) conducts its activities as directed by the Commission in pursuance of the Convention's objectives (Article XV, Article XV.2). It provides a forum for consultation and cooperation on the collection, study and exchange of information necessary for the Commission to exercise its functions. To facilitate its operation, the SC-CAMLR has established two working groups to assist it in formulating scientific advice on key areas of its responsibility. Currently the two groups serving this function are the Working Group on Ecosystem Monitoring and Management (WG-EMM) and the Working Group on Fish Stock Assessment (WG-FSA). These two working groups meet annually and report their findings directly to the SC-CAMLR (CCAMLR 2004). The SC-CAMLR meets annually (CCAMLR 2004).

##### **Last Meeting:**

Scientific Committee - SC-CAMLR-XXIII, 25 to 29 October 2004, Hobart, Australia

#### **1.4.5 Working Groups**

Working Group on Ecosystem Monitoring and Management (WG-EMM) and the Working Group on Fish Stock Assessment (WG-FSA). These two working groups meet annually and report their findings directly to the Scientific Committee (CCAMLR 2004). In 2001 the *Ad hoc* Working Group on Incidental Mortality Associated with Fishing (WG- IMAF) was formed. This group reviews the data on sea bird by-catch also taking into account the incidental mortality associated with trawl fishing the group.

##### **Next Meetings:**

- WG-FSA Subgroup on Assessment Methods, 5 to 9 July 2004, Siena, Italy
- WG-EMM (including the Workshop on Plausible Ecosystem Models for Testing Approaches to Krill Management), 12 to 23 July 2004, Siena, Italy
- WG-FSA (including ad hoc WG-IMAF), 11 to 21 October 2004, Hobart, Australia

#### **1.4.6 National Focal Points**

No information is currently available.

### **1.5 Financial Arrangements**

These are clearly set out in Convention Article XIX and the attached Financial Regulations (CCAMLR 2004). Link to: <http://www.oceanlaw.net/texts/ccamlr.htm>.

### **1.6 Wider Cooperation**

**Convention for the Conservation of Antarctic Seals**  
**Adopted:** London, 1 June 1972

**Entered into force:** 11 March 1978

For full text link to: <http://users.erols.com/jackbobo/1972seals.htm>. Or  
<http://www.oceanlaw.net/texts/summaries/seals.htm>.

### **International Convention for the Regulation of Whaling**

**Signed:** 2 December 1946

For full text link to: <http://www.iwcoffice.org/commission/convention.htm>

### **Protocol to the International Convention for the Regulation of Whaling**

**Signed:** 2 December 1946

For full text link to: <http://www.iwcoffice.org/commission/convention.htm#protocol>.

Information on national CCAMLR-related legislation: Contact and website details link to: <http://www.ccamlr.org/ru/E/ms/ntl-leg-links.htm>.

## **1.7 Partners**

Refer to Regional Seas Partnerships page on the main website.

# **2 Our Work**

## **2.1 Programme Strategy**

Link to Regional Seas Strategic Directions 2004-2007, downloadable document.

## **2.2 Convention**

The Antarctic region is an independent partner programme to the Regional Seas Conventions and Action Plans. As a result over concerns for the health of the Antarctic ecosystem the Antarctic Treaty was adopted, followed by the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The CCAMLR area applies to the Antarctic marine living resources of the area south of 60° South latitude and to the Antarctic marine living resources of the area between that latitude and the Antarctic Convergence which form part of the Antarctic marine ecosystem (CCAMLR 2004). The CCAMLR area therefore includes the Antarctic Treaty Area (which applies only south of 60°S) as well as high seas areas south of the Convergence.

### **The Antarctic Treaty**

**Signed:** 1 December 1959 (by the 12 nations present in Antarctica at that time, and a further 31 nations signed the Treaty after it came into force in 1961 and is still open to any member of the United Nations)

**Entered into force:** 23 June 1961

For full text of the Convention link to:

<http://www.ats.org.ar/treaty.htm>.

### **Protocol on Environmental Protection to the Antarctic Treaty**

**Signed:** 1991

**Entered into force:** 14 January 1998

For full text of the text link to: <http://www.cep.aq/default.asp?casid=5074>.

Or refer to: Handbook of the Antarctic Treaty System.(2002) Ninth Edition, Published by the US Department of State, July 2002, 1012 pp.

<http://www.state.gov/g/oes/rls/rpts/ant/>.

### **The Convention on the Conservation of Antarctic Marine Living Resources**

**Year adopted:** 20 May 1980

**Year entered into force:** 7 April 1982

**Contracting Parties:** Argentina, Namibia, Australia, New Zealand, Belgium, Norway, Brazil, Poland, Chile, Russia, European Community, South Africa, France, Spain, Germany, Sweden, India, Ukraine, India, Italy, United Kingdom, Japan, United States of America, Republic of Korea, Uruguay, Bulgaria, Greece, Canada, Netherlands, Finland, Peru and Vanuatu (CCAMLR 2004).

#### **Ratification**

<b>Participant</b>	<b>Signature</b>	<b>Ratification/ Accession</b>
Argentina	11.09.1980	28.05.1982
Australia	11.09.1980	06.05.1981
Belgium	11.09.1980	22.02.1984
Brazil	-	28.01.1986
Bulgaria	-	01.09.1992
Canada	-	01.07.1988
Chile	11.09.1980	22.07.1981
European Community	-	21.04.1982
Finland	-	06.09.1989
France	11.09.1980	16.09.1982
Germany	11.09.1980	23.04.1982
Greece	-	12.02.1987
India	-	17.06.1985
Italy	-	29.03.1989
Japan	11.09.1980	26.05.1981
Korea, Republic of	-	29.03.1985
Namibia		29.06.2000
Netherlands	-	23.02.1990
New Zealand	11.09.1980	09.03.1982
Norway	11.09.1980	06.12.1983
Peru	-	23.06.1989
Poland	11.09.1980	28.03.1984
Russian Federation	11.09.1980	15.01.1992

South Africa	11.09.1980	23.07.1981
Spain	-	09.04.1984
Sweden	-	06.06.1984
Ukraine	-	22.04.1994
United Kingdom	11.09.1980	31.08.1981
United States	11.09.1980	18.02.1982
Uruguay	-	22.03.1985

Source: Internet Guide to Fisheries (2001)

**Main Objective:** The conservation of Antarctic marine living resources, with conservation being defined to include rational use.

**Principles:**

- (i) Exploited populations shall not be allowed to fall below a level close to that which ensures their greatest net annual increase;
- (ii) Ecological relationships between harvested, dependent and related species shall be maintained and depleted populations shall be restored to the levels defined in (i); and
- (iii) Risks of changes to the marine ecosystem that are not potentially reversible over two or three decades shall be prevented or minimised.

These principles embody what has been called the 'ecosystem approach' to resource conservation and specifically include reference to the need for minimisation of risk in terms of irreversible changes, the 'precautionary approach' (CCAMLR 2004).

**For full text of the Convention link to:** <http://www.oceanlaw.net/texts/ccamlr.htm> or <http://www.ccamlr.org/pu/e/pubs/bd/pt1p1.htm>.

## **2.3 Issues and Threats**

### **2.3.1 Exploitation of Resources**

The resources of the Southern Ocean have been harvested for about 200 years. Exploitation began in the 18th century, when populations of fur seals were reduced close to extinction. In the 19th century, elephant seals, southern right whales (*Eubalaena australis*) and some sub-Antarctic penguins were hunted. The 20th century saw whaling of baleen whales (rorquals) and sperm whales, a limited harvest of male elephant seals, exploratory harvesting of ice seals and the start of fishing for finfish and krill. In recent times, exploratory fishing for stone crabs and squid has also begun. Incidental mortality of Antarctic marine animals and seabirds may arise from various fishing impacts on the marine environment and the biota found therein (CCAMLR 2004).

#### **2.3.1.1 Seal Hunting**

The exploitation of southern elephant seals began at the end of the 18th century when the exploitation of fur seals declined rapidly. They were taken for oil, not for

skin. They were hunted as an adjunct to whaling, particularly in the 20th century. Unregulated sealing stopped in most places within the first two decades of the 20th century. It is not known how many elephant seals had been taken, but assuming the original populations totalled at least 600 000 to 750 000, the harvest was probably more than 1 million of both sexes combined. The size of the Atlantic Ocean stock of southern elephant seals appears not to have changed in the last 40 years: it has fluctuated around 400 000, of which 350 000 are on South Georgia. The breeding populations on Marion Island have declined by more than 80% since 1951. However, the Kerguelen breeding stock (at the Prince Edward, Crozet, Kerguelen and Heard Islands) appeared to have stabilised by 1990 when it totaled about 189 000 seals. Some 143 000 seals were living on the Courbet Peninsula (at Kerguelen Islands) alone. The Macquarie Island stock has declined by 57% since 1949 and now comprises 78 000 seals, 99% of which live on Macquarie Island. A number of causes of the declines in southern elephant seal populations have been suggested, including overfishing of their food resource. However, there is as yet no evidence that fishing in Antarctic waters has contributed to the decline (CCAMLR 2004).

The population of Antarctic fur seals at South Georgia began to recover rapidly from about 1940. There are now more than 2 million seals – probably more than before exploitation (CCAMLR 2004).

Crabeater, Weddell, leopard and Ross seals were taken regularly in small numbers to feed dog teams. They were also taken irregularly during exploratory sealing in the pack-ice, such as from 1892 to 1894 (32 558 seals in the Antarctic Peninsula region). The seals were taken over a wide geographical range. Current estimates of stock sizes are: crabeater seals (11–12 million), Weddell seals (900 000), leopard seals (350 000) and Ross seals (130 000). Harvesting of ice seals and other seal species in the Southern Ocean south of 60°S is regulated under the Convention on the Conservation of Antarctic Seals. The killing of fur, elephant and Ross seals for commercial purposes is prohibited. Although annual catch limits are set for crabeater (175 000), Weddell (12 000) and leopard seals (5 000), these species have not been harvested in recent years (CCAMLR 2004).

### **2.3.1.2 Whaling**

All seven species or subspecies of baleen whales (Mysticeti) that occur south of the Antarctic Polar Front have been extensively exploited. The only toothed whale taken regularly was the sperm whale. Killer whales and southern bottlenose whales were taken irregularly and only in small numbers. Commercial whaling in the Antarctic began in 1904. The more inshore-living humpback whales were the first to be targeted, followed by blue and fin whales. In the 1950s, when the first major declines in whale catches occurred, sei and sperm whales began to form a larger portion of the catch. Minke whales were not pursued in appreciable numbers before 1971, but became the main target species until 1980s.

The first conservation measures to protect whale stocks were introduced under the auspices of the League of Nations in the 1930s. They prohibited the harvesting of right whales, which 19th century whalers had already very much depleted in the breeding grounds off South America, South Africa and Australia. In 1946, the International Convention for the Regulation of Whaling (ICRW) was signed. It established the International Whaling Commission (IWC) as the body responsible for the regulation of whaling. Humpback whales were protected in 1963 and blue whales in 1964. The shift to hunting minke whales followed reduction of the permitted take of other species in the 1970s. In 1979, the IWC established the 'Indian Ocean



Sanctuary', which comprises the entire Indian Ocean, including the northern waters of the Indian Ocean sector of the Southern Ocean as far south as 55°S.

In 1982, the IWC adopted a moratorium on commercial whaling, which came into effect after the 1986/87 season. Since that date, 300 -440 minke whales have been taken annually by Japanese vessels under a scientific permit issued by the Government of Japan. A revision of the moratorium on commercial whaling will be considered after the IWC has completed a comprehensive assessment of the whale stocks of the Southern Ocean and the effects of the moratorium on their recovery. This assessment is currently in preparation. In 1994, the IWC declared the Southern Ocean south of 40°S (except for an area of the southeast Pacific–southwest Atlantic to the south of 60°S) a whale sanctuary ('Southern Ocean Sanctuary'). In this sanctuary, commercial whaling operations, (offshore or land-based) are prohibited. This prohibition will be reviewed in 2004. Japan objected to the establishment of the 'Southern Ocean Sanctuary' and is not bound by the IWC's decision.

### **2.3.1.3 Birds**

King penguins and crested penguins were exploited for oil, food and as fuel for fire on some of the sub-Antarctic islands, such as South Georgia, Heard and Macquarie, during the sealing era of the 18th and 19th centuries. Subsequently, the numbers of king penguins have increased rapidly at all breeding sites – in the range of 8–12% per annum on most sub-Antarctic islands since the 1960s. Data on changes in the populations of crested penguins are anecdotal, but seem to indicate increases at South Georgia at least. In the late 1970s, the number of macaroni penguins at South Georgia almost halved over five years, remained stable until 1994, but decreased by another 30% in the two years thereafter. Eggs of a number of penguin species, including true Antarctic species such as chinstrap and Adélie penguins, and of albatrosses (wandering albatross; black-browed albatross) were harvested by sealers and whalers into the 1950s, when the taking of eggs ended. The effects this may have had on bird populations are unknown. Substantial numbers of albatrosses and petrels are taken as by-catch in longline fisheries. These birds are killed incidentally when attempting to take bait from hooks (CCAMLR 2004).

### **2.3.1.4 Finfish**

Fish species belonging to the sub-order Notothenioidei were subject to unregulated fishing until the advent of CCAMLR and some species were fished to virtual local extinction. CCAMLR, in recent years, has had considerable success in regulating the catches of fish species and, in many cases, fishing is currently banned (Dingwell 1995). The target species of the trawl fisheries are, or have been, marbled rockcod, mackerel icefish, grey rockcod, Patagonian rockcod, sub-Antarctic lanternfish and Wilson's icefish. Frequent by-catch species of the trawl fishery have been humped rockcod, various icefish species and skates. Most species, as far as is known, have been fished primarily for human food, while the small Patagonian rockcod and lanternfish were mainly used for fishmeal (CCAMLR 2004).

In the mid-1980s longlines were introduced to catch Patagonian toothfish. The current high market value of Patagonian toothfish has led to a rapid expansion of the fishery for this species particularly in the Indian Ocean sector of the Southern Ocean, where there is a considerable amount of unregulated fishing. Since 1996/97, the closely related Antarctic toothfish has become the target of a number of new and exploratory fisheries (CCAMLR 2004).

Although on a much shorter time scale, finfishing has paralleled the history of whaling in the Southern Ocean, repeating the pattern of discovery, exploitation and depletion of each new stock. After most of the demersal (bottom-dwelling) fish stocks were depleted, which happened before CCAMLR came into force, benthopelagic (living off the bottom) Patagonian toothfish and mesopelagic (living in oceanic midwater) sub-Antarctic lanternfish began to be harvested in the second half of the 1980s. By the end of the 1980s, fishing for most species was either prohibited, as in the case of the marbled rockcod, or was limited by total allowable catches (TACs). The South Orkney Islands and the Antarctic Peninsula region were closed to fishing (CCAMLR 2004). Some of the stocks, such as the by-catch species around South Georgia, appear to have recovered to some extent from overexploitation, whereas others, such as the marbled rockcod, show little sign of recovery in most areas. Currently, the only viable fisheries are for Patagonian toothfish, and for mackerel icefish when strong year classes enter the fishery (CCAMLR 2004).

### **2.3.1.5 Krill**

Current estimates of the standing stock of Antarctic krill are of the order of 500 million tons and its central role in the Antarctic ecosystem makes its conservation an issue of paramount importance. Its occurrence in huge, densely packed swarms, often several kilometers across and containing tens of thousands of tons, makes it attractive not only to the vertebrate consumers of the region, but also as a commercial fishery (Dingwell 1995).

Krill fishing on a commercial scale started in the 1972/73 season. It soon concentrated in localised areas in the Atlantic Ocean sector, with the main fishing grounds to the east of South Georgia, around the South Orkney Islands and off the north coast of the South Shetland Islands. Catches, in particular those made by vessels from countries of the former Soviet Union, were largely used for animal feed. In the mid-1980s, difficulties in processing krill were overcome. Today, most krill is processed for aquaculture feed, bait and human consumption. Its use in aquaculture and its potential in biochemical products is increasing interest in krill fisheries. Vessels targeting krill aggregations on island shelves or close to shelf breaks are closely monitored. In many cases krill fishing is conducted close to the breeding sites of land-based krill predators such as penguins. Concern has been expressed that krill catches in such areas may affect predators by locally depleting their food source. Land based breeding birds are key consumers of krill and are the group most likely to be adversely affected by a marked increase in the krill fishery should it be confined to areas close to breeding sites (CCAMLR 2004).

The amount of krill harvested to date totals slightly more than 5.74 million tonnes, of which the former Soviet Union and two of its succeeding states (Russia and Ukraine) took almost 84% and Japan 14.5%. More than 90% of the catch was from the western part of the Atlantic Ocean sector (CCAMLR 2004). Currently, between 100 000 - 120 000 tonnes of krill are harvested annually. For further information refer to: Everson, I. (ed), "Krill: Biology, Ecology and Fisheries", Blackwell Science 372pp. 2000

### **2.3.1.6 Crabs**

A very recent development was an exploratory pot fishery for stone crabs (Lithodidae) in waters around South Georgia and Shag Rocks. Two species were targeted: *Paralomis spinosissima* and, to a lesser extent, *P. formosa*. The fishery is limited to sexually mature male crabs and the TAC is set at 1 600 tonnes annually.

### **2.3.1.7 Squid**

There are large squid fisheries directly to the north of the Southern Ocean, such as those on the Patagonian and New Zealand shelves. The range of one of the species in those fisheries, *Martialia hyadesi*, extends into the northern part of the CCAMLR Convention Area. Its standing stock in the Scotia Sea has been estimated at 330 000 tonnes, based on the amount taken by predators, primarily elephant seals. There has been considerable speculation about how much squid there is in the Southern Ocean and how important it is as a predator of krill. Squid are very important as Beaked whales feed almost exclusively on squid in this region.

## **2.4 Current Activities**

### **2.4.1 Fisheries Management**

At present CCAMLR regulates commercial fishing for:

- Antarctic krill (*Euphausia superba*);
- Patagonian/Antarctic toothfish (*Dissostichus* spp.);
- icefish (*Champscephalus gunnari*); and some other species such as:
- Lantern fish (*Electrona carlsbergi*);
- Squid (*Martialia hyadesi*); and
- Crabs (*Paralomis* spp.).

It also regulates by-catch arising from the fisheries directed at these species. CCAMLR set up the CCAMLR Ecosystem Monitoring Program (CEMP) in 1985. CEMP's major function is to monitor the key life-history parameters of selected dependent species ('indicator species', which are likely to respond to changes in the availability of harvested species, particularly krill). In August 2003, the Working Group on Ecosystem Monitoring and Management (WG-EMM) conducted a workshop on the 'Review of CEMP'. A WG-EMM meeting (including the Workshop on Plausible Ecosystem Models for Testing Approaches to Krill Management), will take place 12-23 July 2004, Siena, Italy.

For further information link to: <http://www.ccamlr.org/pu/e/sc/cemp/intro.htm>

### **2.4.2 Management Approach**

The central concepts outlined in the Convention are the precautionary approach and the ecosystem approach. The Commission collects the data it can, and then weighs up the extent and effect of the uncertainties and gaps in such data before making a management decision. The approach aims to minimise the risk of long-term adverse effects rather than delaying decisions until all necessary data are available. The ecosystem approach takes into account all the delicate and complex relationships between organisms (of all sizes) and physical processes (such as currents and sea temperature) that constitute the Antarctic marine ecosystem (CCAMLR 2004).

For further information link CCAMLR Website:

<http://www.ccamlr.org/pu/E/sc/prec-app-intro.htm> and/or  
<http://www.ccamlr.org/pu/E/sc/eco-app-intro.htm>.

Hewitt, R.P. et al. 2002 Setting a precautionary catch limit for Antarctic krill. *Oceanography*, Vol. 15, No. 3

### **2.4.3 Research**

#### **Fishery Catch and Effort Statistics**

The CCAMLR region is divided into three statistical areas: Area 48 (Atlantic Ocean sector), Area 58 (Indian Ocean sector) and Area 88 (Pacific Ocean sector). The fisheries areas are managed by CCAMLR and the catch and effort data, along with biologically related data, are reported to the Secretariat on an individual fishery basis. For further information link to: <http://www.ccamlr.org/pu/e/sc/fish-monit/fm-intro.htm>.

#### **The CCAMLR Scheme of International Scientific Observation**

The Scheme of International Scientific Observation was adopted in 1992 under Article XXIV of the Convention. The Scheme is designed to gather and validate scientific information essential for assessing the population status of selected species and the impact of fishing on such populations, as well as those of related and dependent species. The Secretariat coordinates implementation of the Scheme through a network of national Technical Coordinators designated by Members. The Secretariat has developed a Scientific Observers Manual in consultation with the Scientific Committee, its working groups and observers in the field. For further information link to: <http://www.ccamlr.org/pu/e/sc/obs/intro.htm>

#### **Estimating Abundance from Fishery-independent Surveys**

Abundance estimates are essential for assessing stock sizes. Two main types of survey are used to estimate the abundance of fish, krill and squid species: acoustic surveys and net surveys. Acoustic surveys allow a large area of ocean to be surveyed relatively quickly, but the information acquired still needs to be assessed alongside biological information derived from net catches. Net surveys provide detailed information about small areas, but net surveys are time-consuming. For further information link to: <http://www.ccamlr.org/pu/e/pubs/am/toc.htm>.

#### **Biological Information**

Biological parameters, principally reproductive characteristics, growth curves and natural mortality rates are key components in all the types of yield calculations. Information on these parameters is collected during both scientific surveys and commercial fishing operations. For further information link to: <http://www.ccamlr.org/pu/e/pubs/am/toc.htm>.

#### **Monitoring Dependent Species**

As part of CEMP, this program has two broad aims: to detect and record significant changes in critical components of the ecosystem in order to provide information for conserving Antarctic marine living resources; and to distinguish between changes due to the harvesting of commercial species and changes due to environmental variability, both physical and biological. For further information link to: <http://www.ccamlr.org/pu/e/pubs/am/toc.htm>.

#### **Monitoring Sites**

A core set of sites was chosen from three Integrated Study Regions (ISRs), and a wide network of complementary additional sites was proposed. Within the ISRs, sites were chosen so that researchers could distinguish between broad-scale and local-scale changes, and between changes in fished areas and non-fished areas. Several parameters are monitored for each predator species. Monitoring methods for the

environmental parameters of sea-ice cover, local weather and snow cover have already been agreed.

### **Strategic Modelling for Developing Management Strategies**

The Krill Yield Model (KYM) has recently been developed. The KYM will be continually refined as more data become available to reduce the uncertainty in estimates of some of the input parameters and as more is learnt about the relationships between these inputs. The refinement of the krill and krill–predator models to provide a sounder basis for the selection of a target krill escapement value is a target for the future. A very similar approach to the KYM, termed the ‘Generalised Yield Model’ (GYM), has been applied to some fisheries for finfish. The GYM is very flexible, allowing the use of estimates of current or pre-fishing biomass, along with estimates of their uncertainty, in projections of stock biomass.

Strategic modeling relies on the integration of existing computer models used in CCAMLR with new models, which can then be linked together to form ecosystem models. These integrated models are designed to incorporate the features of an ecosystem that may affect, and may be affected by, conservation and fisheries management. The aim is not to attempt to develop a comprehensive ecosystem model of Antarctica, but rather to develop models that can cast light on particular scientific and management questions. Such models can be used to help decide which factors are critical for determining the likely success of a management system for a given fishery, and give guidance on what information is needed to ensure that success. A Workshop on Plausible Ecosystem Models for Testing Approaches to Krill Management will take place 12-23 July 2004, Siena, Italy.

For further information refer to: CCAMLR's Management of the Antarctic <http://www.ccamlr.org/pu/e/pubs/am/man-ant/toc.htm>.

Understanding CCAMLR's approach to management <http://www.ccamlr.org/pu/e/pubs/am/toc.htm>.

## **2.4.4 Marine Debris**

### **Entanglement of marine mammals in marine debris**

CCAMLR attempts to monitor levels of marine debris in the Southern Ocean by recording, in a standardised fashion, rates at which debris comes ashore on selected beaches in the Antarctic and sub-Antarctic. In general, levels of debris, most of which originates from fishing vessels, have shown little sign of decrease (except possibly as a result of reduced fishing effort in recent years) and are still sufficiently high to indicate that there is much room for improvement in compliance with the provisions of MARPOL by vessels fishing in the Southern Ocean. CCAMLR also requires Members to compile registers of fishing gear lost in the Convention Area.

For further information refer to: CCAMLR's Management of the Antarctic <http://www.ccamlr.org/pu/e/pubs/am/man-ant/toc.htm>.

Understanding CCAMLR's approach to management <http://www.ccamlr.org/pu/e/pubs/am/toc.htm>.

## **2.4.5 Developing Conservation Measures**

Developing conservation measures in accordance with the Convention (Article IX) to manage fisheries and other related activities in the CCAMLR area is a high priority. Some of these measures are very significant and international state of the art, particularly those aimed at eliminating IUU fishing and reducing incident seabird by-

catch. CCAMLR is one of the most proactive and active regional fisheries management organizations worldwide.

#### **2.4.5.1 IUU Fishing**

The term IUU Fishing refers to illegal, unregulated and unreported fishing and was initially developed by CCAMLR and has now come to be characterise a world wide problem. Significant CCAMLR measures to combat IUU fishing include WTO consistent trade measures as well as various measures to deal with non CCAMLR contracting parties. For further information link to:

IUU Introduction: <http://www.ccamlr.org/pu/E/sc/fish-monit/iuu-intro.htm>.

CCAMLR Conservation Measures: <http://www.ccamlr.org/pu/E/pubs/cm/drt.htm>.

#### **2.4.5.2 Incidental Mortality of Seabirds**

In 1992, the CCAMLR established the *Ad hoc* Working group on Incidental Mortality Arising from Longline Fishing (WG-IMALF). The group reviewed the data on sea bird by-catch. Also taking into account the incidental mortality associated with trawl fishing the group was amended in 2001 to the *Ad hoc* Working Group on Incidental Mortality Associated with Fishing (WG- IMAF). Current measures adopted by CCAMLR on the reduction of seabird mortality apply to different types of fishing gear. They comprise measures related to fishing regulations, reporting and compliance as well as guidelines for scientific observation and publication of materials for training and education. No drift net fishing has been carried out in the Convention area since 1990. In 1994 CCAMLR banned the use of trawl netsonde cables as seabirds were killed as a result of interactions with cables. The discharge of offal is also prohibited during the setting and hauling of longline gear. The setting of longline gear is restricted to night time periods only The WG-IMAF, in 2002, initiated a major revision of measures on the reduction of seabird by-catch in longline fisheries. This revision is still in progress.

For further information refer to: <http://www.ccamlr.org/pu/e/sc/imaf/docs/bg-text.pdf>

CCAMLR work on the elimination of seabird mortality associated with fishing  
<http://www.ccamlr.org/pu/E/sc/imaf/docs/bg-text.pdf>.

### **3 Publications**

#### **3.1 Regional Seas Reports and Studies**

Link to the Regional Seas Reports and Studies

#### **3.2 Meeting Reports**

For a full list of Meeting Reports of the Commission link to:

<http://www.ccamlr.org/pu/e/pubs/cr/drt.htm>.

For a full list of Meeting Reports of the Scientific Committee link to:

<http://www.ccamlr.org/pu/e/pubs/sr/drT.htm>.

### 3.3 Other Publications

For a full list of the publications 'Schedule of Conservation Measures in force' link to:  
<http://www.ccamlr.org/pu/e/pubs/cm/drt.htm>

Statistical Bulletin <http://www.ccamlr.org/pu/e/pubs/sb/evol16.htm>

Everson, I. (ed), "Krill: Biology, Ecology and Fisheries", Blackwell Science 372pp. 2000;

El-Sayed, S.Z. (ed). "Southern Ocean Ecology: The BIOMASS Perspective", Cambridge University Press, 399pp. 1994.

### 3.4 Website Links

**CCAMLR** Convention on the Conservation of Antarctic Marine Living Resources  
<http://www.ccamlr.org>.

**Useful links provided by CCAMLR** <http://www.ccamlr.org/pu/e/links.htm>.

**SCAR** The Scientific Committee on Antarctic Research <http://www.scar.org/>

**SCAR Working Group on Biology**

<http://www.up.ac.za/academic/acadorgs/SCARWGB/>

**SCAR Working Group on Glaciology** <http://wdcgc.spri.cam.ac.uk/scar/>.

**SCAR Global Change and the Antarctic (GLOCHANT)**

<http://www.antcra.utas.edu.au/scar/>

**Joint Committee on Antarctic Data Management (JCADM)**

<http://www.jcadm.scar.org>

**SCOR** The Scientific Committee on Oceanic Research <http://www.jhu.edu/~scor/>

**IWC** The International Whaling Commission <http://www.iwcoffice.org/>

**The Antarctic Treaty Secretariat** <http://www.ats.org.ar/>

**Committee for Environmental Protection** <http://www.cep.ag/>.

**International Fisheries Law** link to all Fisheries Agreements with full texts:

<http://www.oceanlaw.net/texts/index.htm>

**Alfred Wegener Institute for Polar and Marine Research:** <http://www.awi-bremerhaven.de>

**Antarctica New Zealand:** <http://www.antarcticanz.govt.nz>

**Australian Antarctic Division:** <http://www.antdiv.gov.au>

**Belgian Antarctic Research Program:** <http://www.belspo.be/antar>

**British Antarctic Survey:** <http://www.antarctica.ac.uk>

**German Federal Environmental Agency:** <http://www.umweltbundesamt.de/uba-info-daten-e/daten-e/antarktis.htm>

**Instituto Antártico Chileno (INACH):** <http://www.inach.cl>

**Italian National Programme of Antarctic Research (PNRA):** <http://www.pnra.it>

**National Institute for Polar Research (Japan):** <http://www.nipr.ac.jp>

**Netherlands Antarctic Programme:**

[http://www.nwo.nl/nwohome.nsf/pages/ACPP\\_4VRDGT\\_Eng?OpenDocument](http://www.nwo.nl/nwohome.nsf/pages/ACPP_4VRDGT_Eng?OpenDocument)

**Norwegian Polar Institute:** <http://www.npolar.no>

**Office of Polar Programs (USA):** <http://www.nsf.gov/od/opp/start.htm>

**Spanish National Antarctic Program** <http://www.mcyt.es/cpe>

**Swedish Polar Research Secretariat:** <http://www.polar.se/english/index.html>

**Uruguayan Antarctic Program** <http://www.iau.gub.uy>

**Council of Managers of Antarctic National Programs (COMNAP):** <http://www.comnap.ag>



Antarctic and Southern Ocean Coalition (ASOC): <http://www.asoc.org>  
 International Association of Antarctic Tour Operators: <http://www.iaato.org>  
 The Joint Australian Centre for Astrophysical Research in Antarctica (JACARA): <http://www.phys.unsw.edu.au/~mgb/jacara.html>  
 Antarctic Research Facility (Florida State University): <http://www.arf.fsu.edu>  
 Byrd Polar Research Center: <http://www-bprc.mps.ohio-state.edu>  
 Institute of Antarctic and Southern Ocean Studies:  
<http://www.antcrc.utas.edu.au/iasos.html>  
 Scott Polar Research Institute: <http://www.spri.cam.ac.uk>  
 European Project for Ice Coring in Antarctica (EPICA):  
[http://www.climate.unibe.ch/clim\\_recon/epica.html](http://www.climate.unibe.ch/clim_recon/epica.html)  
 Gateway Antarctica: <http://www.anta.canterbury.ac.nz>  
 The Australian Antarctic Division (AAD) <http://www.aad.gov.au/>.  
 FAO Fisheries Database and Statistics  
<http://www.fao.org/WAICENT/FAOINFO/FISHERY/statist/statist.asp>.

### 3.5 Newsletter

CCAMLR Science, published annually for a full list of the journal link to:  
<http://www.ccamlr.org/pu/e/pubs/cs/drt.htm>  
 CCAMLR Scientific Abstracts booklet published annually for a full list of the journal link to: <http://www.ccamlr.org/pu/e/pubs/sa/drt.htm>

## 4 Calendar of Events

Meeting	Date
Commission - CCAMLR-XXIII	25 October to 5 November 2004 (Hobart, Australia)
Scientific Committee - SC-CAMLR-XXIII	25 to 29 October 2004 (Hobart, Australia)
WG-FSA Subgroup on Assessment Methods	5 to 9 July 2004 (Siena, Italy)
WG-EMM (including the Workshop on Plausible Ecosystem Models for Testing Approaches to Krill Management	12 to 23 July 2004 (Siena, Italy)
WG-FSA (including ad hoc WG-IMAF)	11 to 21 October 2004 (Hobart, Australia)
SCAR INTERNATIONAL BIOLOGY SYMPOSIUM <a href="http://www.ccamlr.org/pu/e/news/scar-biol-1.pdf">http://www.ccamlr.org/pu/e/news/scar-biol-1.pdf</a> .	25 to 29 July 2005 (Curitiba, Brazil)

Source: CCAMLR (2004)

## 5 References

Dingwell, P. (1995). A Global Representative System of Marine Protected Areas. MARINE REGION 1: Antarctic. Great Barrier Reef Marine Park Authority/The World Bank/The World Conservation Union (IUCN) 1995. (Accessed 07/07/04) Information compiled by Australian Antarctic Division and Paul Dingwall



<http://www.deh.gov.au/coasts/mpa/nrsmipa/global/volume1/chapter1.html>. CCAMLR (2004) Convention on the Conservation of Antarctic Marine Living Resources <http://www.ccamlr.org>. (Accessed 19/07/04)

CCAMLR (2004a) Understanding CCAMLR's Approach to Management. (Accessed 20/07/04)

CIA (2004) Central Intelligence Agency. World Fact Book (Accessed 19/07/04) <http://www.cia.gov/cia/publications/factbook/>.

Internet Guide to Fisheries (2001) The Convention on the Conservation of Antarctic Marine Living Resources (Last updated 31 January 2001) <http://www.oceanlaw.net/texts/summaries/ccamlr.htm#list> (Accessed 20/07/04)

GIWA (2004) Global International Waters Assessment. Regions and Networks (Updated 27/12/2001) <http://www.giwa.net/areas/area64.phtml> (Accessed 20/07/04)

Deacon, G.E.R. (1984) The Antarctic Circumpolar Ocean by G.E.R. Deacon, published in 1984 by Cambridge University Press, 180 pp.

Kock, K.-H. (1992) Antarctic Fish and Fisheries. Cambridge University Press. 359pp.