



CCAMLR-XXVII/BG xx
October 2008
Original: English
Agenda Items 16 (i); 17

**THE CONVENTION ON THE CONSERVATION OF ANTARCTIC
MARINE LIVING RESOURCES (CCAMLR) AND THE ECOSYSTEM
APPROACH**

*As published in the International Journal of Marine and Coastal Law, Vol. 23,
No. 3, 2008*

**THE ANTARCTIC AND SOUTHERN OCEAN COALITION
(ASOC)**

**ASOC Secretariat
1630 Connecticut Ave NW
Washington, DC 20009 USA
Tel: 1-202-234-2480
Fax: 1-202-387-4823
www.asoc.org**

Introductory note

ASOC is submitting for the consideration of the Commission an article recently published in a special issue of the International Journal of Marine and Coastal Law, entitled "*International Ocean Governance in the 21st Century: Perspectives from the IUCN Commission on Environmental Law's Specialist Group on Oceans, Coasts and Coral Reefs*".¹ The paper was co-authored by two members of the ASOC delegation and it covers issues of interest to CCAMLR Members, especially in the context of the performance review of the organisation which is underway.

¹ International Journal of Marine and Coastal Law, Volume 23, Number 3 (2008).

The Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and the Ecosystem Approach

Adriana Fabra*

Consultant, *Pew Environment Group* and the Antarctic and Southern Ocean Coalition,
Adjunct Lecturer, University of Barcelona

Virginia Gascón*

Consultant and policy advisor to the *Antarctic Krill Conservation Project*

Abstract

Lack of adequate governance of the high seas areas has resulted in the continued degradation of ocean and marine habitats. The ecosystem approach, which comprises integrated, precautionary management policies, can be an important tool to reverse this situation. CCAMLR was a pioneer in the incorporation of an ecosystem approach to the conservation and management of marine living resources, and continues to be a leader in its implementation. Through its actions at scientific, institutional and compliance levels, it has attempted to balance conservation objectives with the maintenance of commercial fisheries. CCAMLR has many achievements in this regard, but needs to face new challenges posed by the expansion of fisheries, including illegal, unreported and unregulated (IUU) fishing, if it is not to abandon the core conservation principles embodied in the Antarctic Treaty. Other regional fishery bodies that have committed themselves to incorporating the ecosystem approach in their regimes can learn important lessons from CCAMLR's successes and also from its difficulties. Incorporating the ecosystem approach is an ambitious goal, but one that can contribute significantly to ocean governance.

Keywords

Antarctica, CCAMLR, ecosystem approach, marine living resources

The Ecosystem Approach and its Relevance for Ocean Governance

The lack of adequate governance¹ of high seas areas has resulted in the continued degradation of marine habitats caused by over-fishing, destructive fishing

* We wish to thank Alan Hemmings, Erik Jaap Molenaar, Richard Herr, Susie Grant, Enrique Marschoff, Andrew Constable, and Karl-Hermann Kock for the information and comments they provided. We also thank Gerald Leape (Project Director, *Antarctic Krill Conservation Project*) and the *Pew Environment Group* for their kind support during the completion of this paper.

¹ The term "ocean governance" has been referred to as a set of rules adopted nationally and

practices, pollution, and other anthropogenic impacts. Sectoral regional governance bodies, such as regional fisheries management organizations (RFMOs) or regional arrangements that address marine pollution, tend to apply a sector-based, fragmented approach, leaving unregulated a number of activities with a potential impact on the same area. Fishery regimes in particular often do not give adequate weight to scientific knowledge—especially to the relevant ecosystem dynamics—in their management decisions, and establish very poor, if any, linkages with other regimes—either regional or global—concerned with other activities having an impact on the marine environment.²

To reverse this situation, it is critical to develop adequate policies that consider all human activities that affect the ocean, providing for integrated, precautionary management of the high seas, which takes into account ecosystem dynamics³—what often has been referred to as an *ecosystem approach*.

In spite of the absence of a single definition of the ecosystem approach,⁴ the concept is being increasingly incorporated by international instruments and declarations. The Convention on Biological Diversity (CBD) has described the ecosystem approach as “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.”⁵ The International Council for the Exploration of the Sea (ICES), which has done considerable work to develop the concept, focuses on the *management of human activities* on the basis of available knowledge of ecosystem dynamics, in order to achieve the sustainable use of ecosystem goods and services, and to maintain ecosystem integrity.⁶ Thus, while placing human needs at

internationally for the regulation, management and control of ocean uses, to the decision-making processes that lead to the adoption of these rules, and to the persons and institutions responsible for administering them. See M. Gorina-Ysern, K. Gjerde and M. Orbach, “Ocean Governance: A New Ethos through a World Ocean Public Trust,” in: L. K. Glover and S. A. Earle (eds.), *Defying Ocean’s End: An Agenda for Action* (Island Press, Washington DC, 2004), pp. 197–212, at 198.

² A. H. Hemphill and G. Shillinger, “Casting the Net Broadly: Ecosystem-Based Management Beyond National Jurisdiction,” (2006) 7 *Sustainable Development Law & Policy* 56–59, at 56.

³ M. Gorina-Ysern *et al.*, *op. cit.*, *supra* note 1 at 199.

⁴ In some instruments, the terms ‘ecosystem-based management’ or ‘ecosystem-based approach to management’ are used to refer to the same concept.

⁵ Decision V/6 by the Conference of the Parties to the CBD at its Fifth Meeting, Nairobi, 15–26 May 2000, UNEP/COP/5/23, text at <http://www.cbd.int/decisions/?m=COP-05&id=7148&lg=0>. The central role of the ecosystem approach is also present in decisions II/10, IV/5, V/3 and VII/5. The CBD has carried out considerable activity with regard to the ecosystem approach, including the development of a set of Principles. For CBD information on the ecosystem approach, including relevant COP decisions, see <http://www.cbd.int/ecosystem>.

⁶ International Council for Exploration of the Sea, *Report of the Study Group on Ecosystem Assessment and Monitoring*, 8–12 May 2000, ICES CM 2000/E:09, ICES, Copenhagen, text at www.ices.dk/reports/MHC/2000/sgeam00.doc, at 9.

the centre of biodiversity management, the ecosystem approach seeks to focus natural resources management decisions on the multiple functions that ecosystems perform and the multiple uses that are made of these functions.

Based on existing practice, implementation of an ecosystem approach to marine policies would comprise at least the following elements:

- 1) definition of ecosystem objectives in relation to the state, services and functioning of the ecosystems;⁷
- 2) management advice based on the best scientific information available on ecosystem dynamics;⁸
- 3) adaptive management through research and monitoring;⁹
- 4) preservation of biodiversity;¹⁰
- 5) participatory governance and involvement of relevant stakeholders;¹¹
- 6) integrated policies and assessments;¹² and
- 7) long-term management of current and anticipated combined impact of human activities.¹³

An increasing number of instruments also include the need to establish marine protected areas (MPAs) to preserve the health of ocean ecosystems.¹⁴

⁷ Ministerial Declaration of the Fifth International Conference on the Protection of the North Sea, Bergen, Norway, March 2002 (2002 Bergen Declaration), text at www.ospar.org/documents/02-03/JMMC03/SR-E/JMM%20ANNEX05_Ecosystem%20Approach%20Statement.doc, Annex II; CBD COP Decision V/6, para. 6), *op. cit.*, *supra* note 5.

⁸ 2002 Bergen Declaration, *op. cit.*, *supra* note 7 at para. 2; Johannesburg Plan of Implementation adopted at the 2002 World Summit on Sustainable Development, text at http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf, para. 32 c); CBD COP Decision V/6, *op. cit.*, *supra* note 5 at para. 7.A, 2 and 3.

⁹ Adaptive management represents a pragmatic solution to integrate scientific uncertainty and the complexity of natural ecosystems. It incorporates the need to adjust management measures on the basis of on-going monitoring and research programs. See CBD COP Decision V/6, *op. cit.*, *supra* note 5 at para. 7.A, 4, and para. 6, principle 9. See also 2002 Bergen Declaration, Annex II, *op. cit.*, *supra* note 7.

¹⁰ 2002 Johannesburg Plan of Implementation, *op. cit.*, *supra* note 8 at para. 32 c); CBD COP Decision V/6, *op. cit.*, *supra* note 5 at para. 6, principle 10.

¹¹ Statement on the Ecosystem Approach to the Management of Human Activities, First Joint Ministerial Meeting of the Helsinki and OSPAR Commissions (JMM), Bremen, 25–26 June, 2003, text at www.ospar.org/documents/02-03/JMMC03/SR-E/JMM%20ANNEX05_Ecosystem%20Approach%20Statement.doc; 2002 Bergen Declaration, *op. cit.*, *supra* note 7 at para. 2 and Annex II; CBD COP Decision V/6, *op. cit.*, *supra* note 5 at para. 6, principle 12.

¹² 2002 Bergen Declaration, *op. cit.*, *supra* note 7 at para. 2; 2002 Johannesburg Plan of Implementation, *op. cit.*, *supra* note 8 at para. 32 c).

¹³ 2003 Joint HELCOM/OSPAR Statement, *op. cit.*, *supra* note 11 at para. 27; CBD COP Decision V/6, *op. cit.*, *supra* note 5 at para. 6, principle 8.

¹⁴ 2002 Johannesburg Plan of Implementation, *op. cit.*, *supra* note 8 at para. 32 c); 2002 Bergen Declaration, *op. cit.*, *supra* note 7 at para. 6.

The precautionary approach, although an independent concept in itself, is frequently considered to be a central part of the ecosystem approach.¹⁵ There is no definitive formulation of the precautionary approach, but it has permeated modern environmental regulation and jurisprudence, also in the field of marine conservation and management.¹⁶ A commonly quoted definition of this concept is provided by Principle 15 of the Rio Declaration, which states that where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.¹⁷ Thus, when the viability of an entire ecosystem is at stake, lack of sufficient scientific knowledge—which is frequently the case in marine management, including fisheries—should trigger the need for precaution.¹⁸

When translating the conceptual elements of the ecosystem approach into practical implementation, it becomes clear that a “paradigm shift” is needed, to move from a predominantly fragmented approach to the coherent implementation of long-term policies across the relevant social, economic, and environmental sectors.¹⁹ This paradigm shift has far-reaching scientific and institutional repercussions: *scientific*, as it relates to the need to develop the capacity to assess the combined impacts from different human activities on

¹⁵ 2003 Joint HELCOM/OSPAR Statement, *op. cit.*, *supra* note 11 at, para. 5.

¹⁶ Note that although at times a distinction has been made between the precautionary principle and the precautionary approach, particularly given their legal differences, state practice indicates that the substantive distinction between both concepts is extremely narrow. See A. Trouwborst, *Evolution and Status of the Precautionary Principle in International Law*, (Kluwer Law International, The Hague/Boston/London, 2002), pp. 3–6. See generally on the precautionary principle and its implementation in marine issues, S. Marr, *The Precautionary Principle and the Law of the Sea* (Martinus Nijhoff Publishers, Den Haag/London, 2003); N. De Sadeleer, *Implementing the Precautionary Principle. Approaches from Nordic Countries, EU And US* (Earthscan Publishers, London, 2006); D. Vanderzwaag, “The Precautionary Principle and Marine Environmental Protection: Slippery Shores, Rough Seas, and Rising Normative Tides,” (2002) 33 *Ocean Development & International Law* 165–188.

¹⁷ United Nations Conference on Environment and Development: Rio Declaration on Environment and Development, 14 June 1992, (1992) 31 *International Legal Materials* 874.

¹⁸ The implementation of the precautionary principle responds to the specific circumstances of each case under consideration, and is often considered to be subject to a number of conditions, such as proportionality, non-discrimination, cost-benefit analysis, etc. See references *supra* in note 16. See also requirements described in the Communication from the Commission on the precautionary principle, European Commission, COM (2000) 1 final of 2 February 2000 (not published in the Official Journal); text available at http://ec.europa.eu/environment/docum/20001_en.htm.

¹⁹ D. d’A. Laffoley, E. Maltby, M. A. Vincent, L. Mee, E. Dunn, P. Gilliland, J. P. Hamer, D. Mortimer, and D. Pound, *The ecosystem approach. Coherent actions for marine and coastal environments*. A report to the UK Government (English Nature, Peterborough, 2004), at 7.

the ecosystem, and *institutional*, given that the regulation of the different sectors and activities affecting the ecosystem cannot be approached in isolation, if cumulative impacts are to be addressed to achieve ecosystem integrity and functioning.²⁰ We shall often refer to such institutional aspects of the ecosystem approach as *integrated management*. Effective implementation of such new scientific and institutional models must be accompanied by *compliance* mechanisms that provide adequate control and enforcement measures.

The Ecosystem Approach and Fisheries Policy

A specific application of the ecosystem approach has been the development of the *ecosystem approach to fisheries management* (EAF), which incorporates ecosystem considerations into the regulation of fishing activities, in recognition that traditional single-species management approaches have failed in meeting ecological, social and economic objectives.²¹ The United Nations Convention on the Law of the Sea of 10 December 1982 (LOS),²² the 1995 Fish Stocks Agreement²³ and the Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries²⁴ implicitly endorsed this approach, requiring fisheries managers to assess the impacts of fishing on the different components of the ecosystem, particularly on species dependent on or associated with the targeted stocks. Further work under the auspices of FAO resulted in

²⁰ For example, in the Norwegian Government's White Paper *Clean and Rich Sea*, the ecosystem approach is seen as the means of achieving better sector integration. *Rent og rikt hav*, St.meld nr. 12 (2002), (Clean and rich sea, Government White Paper in Norwegian), Ministry of the Environment, Oslo, text at <http://www.regjeringen.no/Rpub/STM/20012002/012/PDFA/STM200120020012000DDDPDFA.pdf>, quoted in O. A. Misund and H. Rune Skojdal, "Implementing the Ecosystem Approach: Experiences from the North Sea, ICES and the Institute of Marine Research, Norway," (2005) 300 *Marine Ecology Progress Series* 260–265.

²¹ S. Jennings, "The Ecosystem Approach to Fishery Management: a Significant Step towards Sustainable use of the Marine Environment?" (2004) 274 *Marine Ecology Progress Series* 269–303.

²² United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982, entered into force on 16 November 1994, (1982) 21 *I.L.M.* 1261, Art. 119.1(b).

²³ Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, New York, 4 August 1995, entered into force on 11 November 2001, (1995) 34 *I.L.M.* 1542, Preamble, para. 7; Article 5 (d) and (e).

²⁴ Rome, 31 October 1995, text at www.fao.org/DOCREP/005/v9878e/v9878e00.htm. References to the ecosystem approach are found in paragraphs 6.1, 6.2, 6.4, 6.6 (general principles); 7.2.2, 7.2.3 (fisheries management); 9.1.2, 9.2, 9.3.1 (aquaculture); 10.1 (coastal area management); 12.4, 12.5, 12.10, 12.11 (fisheries research).

the adoption of the 2001 Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem,²⁵ which highlighted the need to incorporate ecosystem considerations into fisheries management in order to reinforce responsible and sustainable fisheries. This initiative led to the publication by the FAO in 2003 of the Guidelines on the Ecosystem Approach to Fisheries.²⁶ These guidelines have triggered some debate that reflects underlying differing interpretations of the scope of the ecosystem approach and its operational framework.²⁷

In practice, a number of RFMOs have incorporated the ecosystem approach in their conventions, and others are committing themselves to introduce such ecosystemic considerations into their management regimes. In practice, implementation of the EAF has so far been uneven, due, *inter alia*, to different levels of practical experience in doing so, and to differing perceptions about its scope.²⁸ Current practice indicates, however, that the ecosystem approach is being increasingly perceived by RFMOs as a valid instrument for the sustainable use of marine living resources in high seas areas, and also necessarily, given the need to account for ecosystem-wide considerations, in the exclusive economic zones (EEZs) of relevant coastal states.

In this paper we analyze in detail the formulation and implementation of the ecosystem approach in the framework of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR, for the purposes of

²⁵ In 2001, Iceland and FAO jointly convened a special Conference on Responsible Fisheries in the Marine Ecosystem in Reykjavik, Iceland, which was attended by 59 FAO Members. The objectives of the Conference were to gather and review the best available knowledge on marine ecosystem issues, to identify means by which ecosystem considerations could be included in capture fisheries management, and to identify future challenges and relevant strategies. The Conference adopted The Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem, which highlights the need to incorporate ecosystem considerations into fisheries management, in order to reinforce responsible and sustainable fisheries. The Reykjavik Declaration identified actions to incorporate ecosystem considerations in the work of regional and international fisheries management organizations and to advance the scientific basis for incorporating ecosystem considerations into fisheries, building on existing and future available scientific knowledge. It also encouraged FAO to develop technical guidelines for best practices with regard to introducing ecosystem considerations into fisheries management. See FAO, Report of the Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem, Reykjavik (Iceland), 1–4 October 2001, FAO Fisheries Report no. 658, text at <ftp://ftp.fao.org/docrep/fao/005/y2198t/y2198t00.pdf>, Appendix I.

²⁶ FAO Fisheries Department, FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 2. (FAO, Rome, 2003), 112 p.

²⁷ S. Tudela and K. Short, “Paradigm shifts, gaps, inertia, and political agendas in ecosystem-based fisheries management,” (2005) 300 *Marine Ecology Progress Series* 282–286, at 283.

²⁸ A. Willock and M. Lack, *Follow the Leader: Learning from experience and best practice in regional fisheries management organizations* (WWF International and TRAFFIC International, Gland, 2006), at 18–21.

this paper), which applies to both high seas areas and the EEZs around Antarctica. An analysis of practice by a regime with more than 25 years of experience in implementing the ecosystem approach, such as CCAMLR, may offer good insights on the components of the ecosystem approach, its implementation challenges, and its value as a comprehensive management tool for high seas resources.

Core Elements of the CCAMLR Regime

CCAMLR was adopted in 1980²⁹ and is usually regarded as a model of progressive natural resources management. Although the Commission of CCAMLR has been generally considered to be unlike other RFMOs, or to be “more” than an RFMO,³⁰ CCAMLR carries out some tasks that are virtually equal to those of other existing regional fishery bodies. A particular characteristic of CCAMLR, and hence its potential for continuing to offer useful lessons to other regional arrangements with competence over high seas areas, is that its main goal is the conservation of marine living resources, with a very strong focus on the ecosystem, while allowing the use of these resources.

CCAMLR is a stand-alone convention, but is also a creature of the Antarctic Treaty;³¹ it is intertwined in the structure of the Antarctic Treaty System (ATS).³² CCAMLR is currently one of the three agreements in force adopted by the Consultative Parties of the Antarctic Treaty. The two other agreements are the Convention on the Conservation of Antarctic Seals of 1972 (Antarctic Seals Convention),³³ in force since 1978, and the 1991 Protocol on Environmental Protection to the Antarctic Treaty (Environment Protocol), which entered into force in 1998.³⁴

²⁹ Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), done at Canberra, 20 May 1980; in force on 7 April 1982, (1982) 19 *I.L.M.* 841.

³⁰ E. J. Molenaar, “CCAMLR and Southern Ocean Fisheries,” (2001) 16(3) *International Journal of Marine and Coastal Law* 465–499, at 499.

³¹ The Antarctic Treaty, done at Washington, 1 December 1959, entered into force 23 June 1961, (1959) 402 *U.N.T.S.* 71.

³² On the relationship between CCAMLR and the Antarctic Treaty, see *infra* note 77.

³³ Convention on the Conservation of Antarctic Seals of 1972 (Antarctic Seals Convention), done at London, 1 June 1972; in force in March 1978; amended in 1998, (1972) 11 *I.L.M.* 251.

³⁴ Protocol on Environmental Protection to the Antarctic Treaty (Environment Protocol), done at Madrid, 4 October 1991; in force in January 1998, (1991) 30 *I.L.M.* 1455. Two other agreements were also adopted in the context of the Antarctic Treaty System: the Agreed Measures for the Conservation of Antarctic Fauna and Flora, adopted 13 June 1964, 17 *U.S.T.* 992,

The negotiation and signing of CCAMLR responded to a mandate of the Antarctic Treaty to its Contracting Parties to take measures “in respect of the preservation and conservation of living resources in Antarctica.”³⁵ Accordingly, CCAMLR established as its core objective “the conservation of Antarctic marine living resources.” At the same time CCAMLR permitted the “rational use” of these resources, thus opening the door to their exploitation.³⁶ This apparent ambivalence (or potential conflict) of interests—conservation and exploitation—shapes the entire CCAMLR regime.

CCAMLR’s delimitation of its area of competence is in itself a manifestation of an ecosystemic view of the ocean, as it establishes its boundary at the Antarctic Convergence, which is considered to be the natural boundary of the Antarctic marine ecosystem. This area of application is well beyond the less extensive boundary of the Antarctic Treaty Area at 60° South. Waters in the CCAMLR Area are a mix of high seas and coastal state maritime zones, some of which are contested by the original signatories of the Antarctic Treaty.³⁷

CCAMLR applies to all the populations of Antarctic marine living organisms found south of its natural boundary. Only whales and Antarctic seals are excluded from its scope, as pre-eminence is given to the pre-existing International Convention for the Regulation of Whaling of 1946 (ICRW) and to the Antarctic Seals Convention. This “holistic” approach to the resources that are subject to the application of CCAMLR is another reflection of the ecosystemic view that guides CCAMLR.

CCAMLR was the first international agreement to incorporate the ecosystem and precautionary approaches into the conservation and management of marine living resources. The ecosystem approach is implicitly formulated in Article II(3)(b), which comprises an obligation to maintain the ecological relationships between harvested, dependent and related populations of Antarctic marine living resources, and to restore depleted populations. But recognition

T.I.A.S. No. 6058 (later on replaced by the 1991 Environment Protocol), and the Convention on the Regulation of Antarctic Mineral Resource Activities of 1988, which never entered into force, (1988) 27 *I.L.M.* 868.

³⁵ Art. IX.1.(f) of the Antarctic Treaty as quoted by the Preamble of CCAMLR.

³⁶ CCAMLR, Art. II.1 and II.2.

³⁷ For these areas north of 60° South, CCAMLR’s Article IV(b) and (c) offers an ambiguous solution, intended to accommodate the interests of both claimants and non-claimants to such areas of the Southern Ocean. With the so-called “bifocal approach,” CCAMLR at the multilateral level glided over the issue of territorial claims to islands north of 60° South, which was left to be dealt with bilaterally between concerned states. On jurisdictional issues concerning the CCAMLR area, and their significance for the conservation and management of marine living resources, see C. Joyner, *Antarctica and the Law of the Sea* (Martinus Nijhoff Publishers, Dordrecht, 1992), pp. 226–228; E. J. Molenaar, *op. cit.*, *supra* note 30 at 477–482; L. Pinechi, *La protezione dell’ambiente in Antartide* (CEDAM, Padova, 1993), pp. 239–241.

of this approach is also reflected in several of the functions given to the Commission of CCAMLR, such as the designation of protected species or special areas for protection and scientific study, or the need to take into account the impacts of fishing in the wider ecosystem.³⁸

CCAMLR does not include an explicit formulation of the precautionary approach. However, Article II(3)(c) requires that harvesting be conducted in a way that minimizes the “risk of changes in the marine ecosystem which are not potentially reversible over two or three decades, taking into account the state of available knowledge of the direct and indirect impact of harvesting, the effect of the introduction of alien species, the effects of associated activities on the marine ecosystem and of the effects of environmental changes, with the aim of making possible the sustained conservation of Antarctic marine living resources.” This requirement to minimise risks on the basis of available knowledge represents CCAMLR’s particular formulation of precaution, which is intrinsically linked to ecosystemic considerations.³⁹ As CCAMLR understands this concept, in the face of uncertainty, the extent and effect of uncertainties need to be weighed before taking a management decision. CCAMLR does not foresee delaying decisions until all necessary data are available.⁴⁰

The Implementation of the Ecosystem Approach in CCAMLR: Achievements and Challenges

Scientific Implications of the Implementation of the Ecosystem Approach

The Commission of CCAMLR has been generally recognized as the only regional fisheries body that routinely carries out a comprehensive application of the EAF.⁴¹ The Commission has taken some outstanding measures, including:

³⁸ See, in particular, CCAMLR, Art. IX(2).

³⁹ It is beyond the scope of this paper to analyse CCAMLR’s provisions in comparison with more recent articulations of the precautionary approach, but it is clear from CCAMLR practice that precaution is at the centre of its approach to the conservation and management of marine living resources in the Convention Area. See: A. Constable, W. de la Mare, D. Agnew, I. Everson, and D. Miller, “Managing fisheries to conserve the Antarctic marine ecosystem: practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR),” (2000) 57 *ICES Journal of Marine Science* 778–791, at 783.

⁴⁰ See CCAMLR Secretariat’s explanations on implementation of a precautionary approach on its own website at www.ccamlr.org.

⁴¹ C. Redgwell, “Protection of Ecosystems under International Law: Lessons from Antarctica,” in: A.E. Boyle and D. Freestone (eds.), *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford University Press, Oxford, 1999), pp. 205–224, at 205–06; A. Willock and M. Lack, *op. cit.*, *supra* note 28 at 18.

- 1) the development of a precautionary approach to the establishment of catch limits for target species;
- 2) the development of a management regime for Antarctic krill that takes into account the impact of fishing on dependent species;
- 3) the establishment of an ecosystem monitoring program;
- 4) the development of specific policies to manage new and exploratory fisheries;
- 5) the adoption of effective seabird by-catch mitigation rules and other gear restrictions to minimize the ecosystem impacts of fishing; and
- 6) the collection of data on by-catch and ecosystem impacts through the CCAMLR Scheme of International Observation.⁴²

All these initiatives constitute effective implementations of an ecosystem approach to the conservation and management of marine living resources, most of which have been as yet unmatched by other regimes with similar objectives.

CCAMLR's evolution towards the development of *precautionary approaches to the establishment of catch limits* has been well documented.⁴³ The most notable example has been the formulation of catch limits for krill which not only attempts to incorporate uncertainty, but also to consider the needs of krill-dependent predators by adopting an escape rate of 75%, instead of the 50% commonly used in single-species fisheries management.⁴⁴ CCAMLR has adapted the Krill Yield Model, developed for krill, to the establishment of catch limits for other target species, allowing for a more sophisticated and comprehensive treatment of uncertainty than had been previously achieved.⁴⁵

Although CCAMLR catch limits are generally deemed to be based on solid science and to specifically take account of uncertainties, on some occasions the difficulty of Commission representatives in endorsing low quotas has influenced scientific advice, as occurred in 2004 in the case of the toothfish fishery around South Georgia.⁴⁶

⁴² A. Willock and M. Lack, *op. cit.*, *supra* note 28.

⁴³ See: A. Constable *et al.*, *op. cit.*, *supra* note 39 at 783–785.

⁴⁴ J. P. Croxall and S. Nicol, "Management of Southern Ocean fisheries: global forces and future sustainability," (2004) 16 *Antarctic Science* 569–584, at 573.

⁴⁵ G. Parkes, "Precautionary Fisheries Management: the CCAMLR Approach," (2000) 24 *Marine Policy* 83–91, at 85.

⁴⁶ In 2004, the Scientific Committee of CCAMLR was unable to recommend a specific catch limit for toothfish around South Georgia due to differing views on how to deal with past assessment errors. When applying the methodologies commonly used by CCAMLR, the resulting recommended catch limit would have implied a significant reduction in the fishery. The Scientific Committee handed over the issue to the Commission, indicating that the decision of

Another challenge is related to the emergence of Illegal, Unreported and Unregulated (IUU) fishing for toothfish in the CCAMLR Area, which has caused severe stock declines in some areas of the Southern Ocean.⁴⁷ Although the Scientific Committee of CCAMLR has attempted to consider IUU estimates in its assessment, these assessments are always uncertain, and scientific advice may be influenced by the perception by CCAMLR Members that significant reductions of fishing effort for toothfish stocks would be unfairly penalising legal operators.

In the case of krill, even the establishment of precautionary catch limits is by itself insufficient to ensure that CCAMLR's conservation principles are not undermined as a result of krill fishing. Hence, the development of a *management regime for Antarctic krill that takes into account the impact of fishing on dependent species*, as required by Article II(3)(b), calls for more sophisticated procedures. This is because, even if catch limits incorporate uncertainty and generally take into account the food web implications of the extraction of krill, precautionary catch limits are set for large areas of the ocean and do not take into account the ecological relationships between krill, dependent species, and fishing operations, which occur at much smaller scales.

Although CCAMLR has established Small-Scale Management Units (SSMUs) for the management of the krill fishery in the most heavily fished areas around the so-called Scotia Sea,⁴⁸ it has not yet been able to establish catch limits for each of these SSMUs in a way that minimises competition between the fishery and krill-dependent predators. Lack of empirical data at the SSMU level on relevant factors, such as the population dynamics of krill, abundance and krill demand of predators, or the impacts of climate change and other environmental factors, represents an enormous challenge, despite the progress made in the area of multi-species (krill/krill-predators) modelling. In the face of such uncertainty and gaps in scientific information, CCAMLR is looking into developing *feedback management procedures* for krill fisheries, by which management measures are adjusted regularly, based on ecosystem monitoring indices. In other words, feedback management (a type

what level of catch could be taken without a 'substantial increase in the probability of depletion' was not a scientific issue and fell within the remit of the Commission. See *Report of the Twenty-Third Meeting of the Scientific Committee for the Conservation of Antarctic Marine Living Resources* (2004), paras. 4.32–4.34 and 10.49–10.55. Text at http://www.ccamlr.org/pu/e/e_pubs/st/drt.htm.

⁴⁷ A. Constable *et al.*, *op. cit.*, *supra* note 39 at 782.

⁴⁸ Currently, the main fishing grounds are in FAO Statistical Area 48, around the Antarctic Peninsula and some Sub-Antarctic islands in the South Atlantic. S. Kawaguchi and S. Nicol, "Learning about Antarctic krill from the fishery," (2007) 19 *Antarctic Science* 219–230, at 220.

of adaptive management) aims at detecting the impacts of fishing so as to allow the adjustment of management measures before irreversible changes occur.

In order to better understand the effects of fishing on the ecosystem and to assist CCAMLR in its task in applying an EAF, CCAMLR established a *monitoring programme* (CCAMLR's Ecosystem Monitoring Programme or CEMP) in 1985, which periodically gathers data from a network of designated sites in relation to a limited number of krill-dependent predators which were selected as indicator species. However, CEMP sites in Antarctica respond to shifting national priorities and are not necessarily coordinated around the need to respond to relevant questions for krill fisheries regulation in a feedback-management context. CEMP sites are therefore not representative of all the areas that are currently being fished.

The adoption by CCAMLR, as early as 1991, of *specific policies to manage new and exploratory fisheries*, is widely used as a notable example of the application of the precautionary approach to fisheries management. The rationale behind these measures is that the development of new fisheries should not occur at a rate faster than CCAMLR's ability to evaluate the implications of the fishery in the light of CCAMLR conservation principles.⁴⁹ Consequently, CCAMLR Members seeking to initiate a new fishery are required to notify the CCAMLR Commission and to present a data collection plan so as to allow the CCAMLR Scientific Committee to advise on conservative catch limits. A new fishery is designated an 'exploratory fishery' after its first year of operation. Exploratory fisheries requirements remain in place until a full assessment of the fishery and stocks is conducted. It remains a challenge for CCAMLR to clarify the decisions and management procedures needed at the various stages of fishery development, and how to make sure that the right data are collected for an adequate stock assessment.⁵⁰

Another problem in relation to CCAMLR's new and exploratory fisheries regime is that there is no specific mechanism by which the CCAMLR Commission can reject a proposal to initiate a new fishery. That is to say, in spite of the notification and data collection requirements, new fisheries are essentially open unless a specific conservation measure closes the fishery in question before it has been opened. In reality, this is unlikely to happen because such a measure would have to be agreed by consensus. As a consequence, in spite of the specific measures developed for new and exploratory fisheries, so far

⁴⁹ A. Constable *et al.*, *op. cit.*, *supra* note 39 at 785.

⁵⁰ For a more detailed description of problems related to the new and exploratory fishery measures in CCAMLR, see G. Parkes, *op. cit.*, *supra* note 45.

CCAMLR has not been able to stall the expansion of new fisheries in the Convention Area, and has been criticized for a lack of precaution in allowing the expansion of a number of fisheries around Antarctica.⁵¹

An easier challenge for CCAMLR has been the *development of mitigation measures to minimise seabird mortality in CCAMLR-regulated finfish fisheries*, especially long-lining. The establishment of an *ad hoc Working Group on Incidental Mortality Associated with Longline Fishing (IMALF)*⁵² in 1993, which recommended a series of mitigation conservation measures adopted by the CCAMLR Commission, has allowed CCAMLR to reduce mortality of albatrosses and petrels from the alarming rates of the late 1980s to the current zero by-catch recorded last year in all the areas where CCAMLR conservation measures apply.⁵³ However, three challenges remain in order to effectively reduce the pressure on Southern seabird populations from incidental mortality as a result of fishing:

- (a) to bring IUU longlining under control, as IUU fishers do not abide by CCAMLR rules;
- (b) to achieve effective application of CCAMLR mitigation measures by legal operators in the French EEZs within CCAMLR's area of application;⁵⁴ and
- (c) to promote the application of these mitigation measures in areas beyond CCAMLR jurisdiction where long-line fishing occurs.

In recent years, CCAMLR has developed other important *measures to reduce ecosystem impacts from fishing*, such as the prohibition on fishing for sharks,⁵⁵ a ban on deep-sea gillnetting,⁵⁶ and a measure to restrict bottom fishing in the

⁵¹ C. de Fontaubert and I. Lutchman, *Achieving Sustainable Fisheries: Implementing the New International Legal Regime* (IUCN, Gland, 2003), at 38.

⁵² The terms of reference of this group were modified to also account for incidental mortality associated with trawl fishing, and the group's name was changed in 2001 to the *Ad hoc Working Group on Incidental Mortality Associated with Fishing (IMAF)*.

⁵³ *Report of the Twenty-Sixth Meeting of the Scientific Committee for the Conservation of Antarctic Marine Living Resources* (2007), text at http://www.ccamlr.org/pu/e/e_pubs/sr/drt.htm, at para. 5.3.

⁵⁴ France is generally exempted from the mandatory application of CCAMLR conservation measures in these EEZs, in accordance with the Chairman's Statement of 19 May 1980, adopted upon CCAMLR's approval and included in the Final Act of the Conference. See Statement by the Chairman of the Conference on the Conservation of Antarctic Marine Living Resources, 19 May 1980, text at http://www.ccamlr.org/pu/e/e_pubs/bd/pt1.pdf, at 23.

⁵⁵ CCAMLR Conservation Measure 32–18 (2006). Available at http://www.ccamlr.org/pu/e/e_pubs/cm/drt.htm.

⁵⁶ CCAMLR Conservation Measure 22–04 (2006), *supra* note 55.

CCAMLR Area to protect deep-sea vulnerable marine ecosystems (VMEs),⁵⁷ in implementation of UN General Assembly Resolution 61/105.⁵⁸

CCAMLR's achievements in developing innovative approaches to fisheries management have been made possible in great part by the collection of data through *CCAMLR's Scheme of International Scientific Observation*. Valuable information gathered by observers on aspects such as by-catch and operational fishing practices have enabled the development of key measures to minimize impacts on the Antarctic marine ecosystem as a result of fishing.⁵⁹

The CCAMLR observer scheme was adopted in 1992 to gather and validate fishery-related scientific information. Based on bilateral agreements between CCAMLR Members (i.e., the state to which the fishing vessel is flagged and the state designating the observers), the scheme offers sufficient flexibility to Members to choose how to formalise observer arrangements, while providing guarantees that scientific observer programmes are conducted in a consistent and standardised way throughout the fishery, and that scientific observers are given access to the relevant data. Scientific observer information gathered under the CCAMLR scheme is the key to assessing the status of the populations of Antarctic marine living resources and the impact of fishing on such populations, as well as on those of related and dependent species.⁶⁰ In spite of this, an important drawback of the system has been its lack of mandatory application to the largest Antarctic fishery, targeting Antarctic krill, which is the keystone species in the Antarctic ecosystem.

Overall, even if important progress has been made so far in the development of scientific knowledge, and in its incorporation in decision-making processes, we can observe some general problems related to the implementation of an ecosystem approach to the conservation of marine living resources in the CCAMLR Area. Some of them concern the lack of sufficient scientific data, and a mismatch between the expansion of CCAMLR-regulated fisheries, on the one hand, and investments in the scientific research that would be needed for their management, on the other. The question still remains whether the range of assessment methods and conservation measures developed by

⁵⁷ CCAMLR Conservation Measure 22–06 (2007), *supra* note 55.

⁵⁸ United Nations General Assembly Resolution 61/105, adopted on 8 December 2006, UN Doc. A/RES/61/105, 6 March 2007, available at <http://daccess-ods.un.org/TMP/1284554.html>, para. 83.

⁵⁹ J. P. Croxall and P. N. Trathan, "The Southern Ocean: a model system for conserving resources?" in: Glover and Earle, *op. cit.*, *supra* note 1, pp. 71–86, at 84.

⁶⁰ See: E. N. Sabourenkov and E. Appleyard, "Scientific observations in CCAMLR fisheries: past, present and future," (2005) 12 *CCAMLR Science* 81–98, at 81 and 84.

CCAMLR over the last 25 years is sufficient to maintain the ecological relationships between harvested, dependent and related populations of Antarctic marine living resources, and to avoid changes that are irreversible over two or three decades, as mandated by Article II of the Convention.⁶¹ A particularly difficult challenge for CCAMLR science is to assess the combined impacts of fishing and climate change on the Antarctic marine ecosystem, a challenge that CCAMLR has only started to address.⁶²

In addition, although CCAMLR has banned the extraction of certain species in specific areas to prevent overfishing or to allow the recovery of locally depleted populations of target species, it has not yet declared any protected species nor established special areas for protection or scientific study, in the sense of Article IX (2), (d) and (g). The issue of protected areas is examined *infra*.

Institutional Aspects

Inasmuch as the realisation of the ecosystem approach is based on robust scientific criteria and inputs, it also requires an *integrated management* approach, which brings together all actors and instruments that are relevant to conservation and management in relation to a particular ecosystem. In a fragmented international regulatory system, it becomes especially relevant—and essential—that different regimes enter into relationships with each other.

We examine below CCAMLR's institutional structure and operation, and opportunities for the implementation of integrated approaches in the CCAMLR Area. This analysis includes the relationships between CCAMLR and other relevant international instruments both inside and outside the ATS.

Decision-making

CCAMLR operates through a *Commission*, a *Scientific Committee*, and a *Secretariat*.⁶³ Management decisions take the form of *conservation measures*, which are adopted by consensus of all Commission Members at CCAMLR annual

⁶¹ A. Constable *et al.*, *op. cit.*, *supra* note 39 at 11.

⁶² See *Report of the Twenty-Sixth Meeting of the Commission for the Conservation of Antarctic Marine Living Resources* (2007), paras. 15.16–15.36. Available at http://www.ccamlr.org/pu/e/e_pubs/cr/drt.htm.

⁶³ CCAMLR, Arts. IX, XV and XVII, respectively.

meetings, and are binding upon all Members.⁶⁴ Conservation measures should be based on the best scientific evidence available and take full account of the recommendations and advice of the Scientific Committee.⁶⁵ The central role of the Scientific Committee in the development of management decisions has been one of the keys to the success of CCAMLR in bringing the ecosystem approach into practice.⁶⁶ The Scientific Committee has established scientific working groups on different issues of interest to CCAMLR,⁶⁷ which help formulate solid scientific advice to implement the conservation principles of the Convention, thanks to the contributions by top-level scientists from Antarctic and fisheries research institutions.

The functional independence of the Scientific Committee from the Commission and its proven scientific authority have assisted Members in agreeing on far-reaching conservation measures. However, the Scientific Committee is not free from political interference, and as a result some of its members may defend propositions that are better aligned with the interests of specific states than with the requirements of providing solid scientific advice to achieve CCAMLR's conservation objectives.⁶⁸

The application of the rule of consensus in decision-making⁶⁹ emanates directly from the fact that CCAMLR was adopted within the framework of the Antarctic Treaty, which formalised the need to respect the delicate balance of sovereign interests between states claimant and non-claimant to territories of Antarctica. The rule of consensus may facilitate implementation, as CCAMLR measures are accepted by all Members, and may also help balance CCAMLR's double objective (*conservation* and *use*).

In practice, the need to reconcile the interests of all Member States may at times result in the Commission of CCAMLR adopting decisions that reflect the lowest common denominator, and may also slow down the decision-making

⁶⁴ Non-binding decisions of the Commission take the form of Resolutions, by which Members can express a special interest and commitment to act on certain issues but without having to undertake legally binding obligations.

⁶⁵ CCAMLR, Art. IX(1)(f) and IX(4).

⁶⁶ A. Willock and M. Lack, *op. cit.*, *supra* note 28 at 24. For other important roles of the Scientific Committee, see also CCAMLR, Art. XV(2).

⁶⁷ Currently there are three working groups: Working Group on Fish Stock Assessment (WG-FSA), Working Group on Ecosystem Monitoring and Management (WG-EMM), and Working Group on Statistics, Assessments and Modelling (WG-SAM).

⁶⁸ See, for example, discussion by the Scientific Committee about the need for scientific observers on all krill vessels. *Report of the Twenty-Fourth Meeting of the Scientific Committee for the Conservation of Antarctic Marine Living Resources* (2005), text at http://www.ccamlr.org/pu/e/e_pubs/cr/drt.htm, paras. 2.8–2.23.

⁶⁹ CCAMLR, Art. XXII(1).

process.⁷⁰ In some cases, the need for consensus has enabled individual states to veto the adoption of important measures.⁷¹

CCAMLR's origins, and also its political reality, make it difficult to expect an abandonment of the consensus rule in the foreseeable future. However, the regime should seriously consider some steps forward in this regard, particularly on the application of enforcement measures.⁷² The unprecedented opening of the Southern Ocean to global fishing operations, and the fact that most CCAMLR Members now have an interest in fishing, are new elements that were not present at the time when CCAMLR was negotiated, and may threaten the balance between conservation and rational use of Antarctic marine living resources. Maintaining this balance under the consensus rule will be an increasing challenge for CCAMLR, a challenge that CCAMLR must face if it is to meet its goals.

In relation to stakeholder participation, CCAMLR allows observers to attend Commission meetings and the meetings of some of its subsidiary bodies.⁷³ Observers include non-Member States that are Parties to the Convention (and not yet Commission Members) to attend, and also non-Contracting Parties to CCAMLR.⁷⁴ In addition, meetings of the Commission and of the Scientific Committee are also open to representatives of international

⁷⁰ In contrast, majority voting, used in some international organizations also concerned with the management of fisheries, especially for the adoption of measures on the conservation and management of these resources, is sometimes perceived to be a more effective mechanism. On decision-making in RFMOs, see: J. Swan, "Decision-Making in Regional Fishery Bodies or Arrangements: The Evolving Role of RFBs and International Agreement on Decision-Making Processes," FAO Fisheries Circular No. 995 (FAO, Rome, 2004), at 21. See also commentary in A. Willock and M. Lack, *op. cit.*, *supra* note 28 at 34.

⁷¹ For example, in 2007, Argentina blocked the adoption of a new Conservation Measure establishing the use of trade-related sanctions against states that undermine the CCAMLR regime. On MPAs, there was opposition to the creation of an MPA around the Balleny Islands in 2000. See: B. Clark and A. Hemmings, "Problems and Prospects for the Convention on the Conservation of Antarctic Marine Living Resources Twenty Years On," (2001) 4 *Journal of International Wildlife Law & Policy* 1, at 56. See also the Antarctic and Southern Ocean Coalition (ASOC) report on the inability of the Scientific Committee to advise on a precautionary quota for Patagonian toothfish in South Georgia in 2004. ASOC, Report on CCAMLR XXIII, available at <http://www.asoc.org/Documents/XXIII/CCAMLR/ASOC%20report.CCAMLR2004.pdf>, at 14.

⁷² For example, it should establish that Commission Members with vessels engaged in IUU fishing do not participate in decisions concerning the inclusion of such vessels in the Contracting Party IUU Vessel List.

⁷³ Attendance at working groups of the Scientific Committee is not granted for NGO observers.

⁷⁴ In relation to cooperation with non-parties, CCAMLR has successfully involved some states in cooperating in the implementation of the Catch Documentation Scheme (CDS).

organizations, of specialised bodies of the ATS, and of non-governmental organizations (NGOs).⁷⁵

Relationship with Other Agreements and International Bodies

Integrated management means that all relevant factors *within* a management regime need to be coordinated if ecosystem dynamics are to be considered. At the same time, different regimes with an impact on a certain ecosystem need to be aligned in their respective efforts. A number of international regimes overlap in Antarctic waters. In this section we examine CCAMLR's linkages with other regimes, especially with other elements of the ATS.

The Environment Protocol

The Environment Protocol has as its main objective “the comprehensive protection of the Antarctic environment and dependent and associated ecosystems,”⁷⁶ and establishes that the protection of the Antarctic environment shall be a fundamental consideration in the planning and conduct of *all* activities in the Antarctic Treaty Area. In doing so, the Protocol builds on a decade of understanding and developing the ecosystem approach, and adopts an approach compatible with that of CCAMLR.⁷⁷ The Protocol has six Annexes, five of which are in force.⁷⁸ Of special relevance to CCAMLR are Annex II on Conservation of Fauna and Flora, and Annex V on Area Protection and Management. The Environment Protocol established the Committee on Environmental Protection (CEP), an advisory body to the Antarctic Treaty Consultative Parties (ATCPs) with regard to the implementation of the Protocol. The CEP normally meets annually in conjunction with the Antarctic Treaty Consulta-

⁷⁵ There are only two non-governmental entities accredited to attend CCAMLR meetings: ASOC and the Coalition of Legal Toothfish Operators (COLTO). As coalitions, they have been authorised to send a significant number of representatives in past meetings. Other observers attending Commission meetings, listed as international organizations, are FAO, Agreement on the Conservation of Albatrosses and Petrels (ACAP), the IWC, and IUCN.

⁷⁶ Environment Protocol, Art. 2.

⁷⁷ R. A. Herr, “CCAMLR and the Environmental Protocol: Relationships and Interactions” in D. Vidas (ed.), *Implementing the Environmental Protection Regime for the Antarctic* (Kluwer Academic Publishers, Dordrecht, 2000), at 5.

⁷⁸ Annex I, Environmental Impact Assessment; Annex II, Conservation of Antarctic Fauna and Flora; Annex III, Waste Disposal and Waste Management, and Annex IV, Prevention of Marine Pollution, were adopted together with the Protocol itself. The Protocol and the first four annexes entered into force on January 14, 1998. Annex V on Area Protection and Management was adopted by the 16th ATCM on 17 October 1991 and entered into force on 24 May 2002. Annex VI, Liability Arising From Environmental Emergencies, was adopted by the 28th ATCM on June 14, 2005 and is not yet in force.

tive Meeting (ATCM), in order to develop recommendations on the adoption of mandatory measures, procedural decisions or hortatory resolutions by the ATCM, on the different matters covered by the Protocol.⁷⁹

The overlap between CCAMLR and action by the ATCPs, in particular concerning the implementation of the Environment Protocol, is apparent. The Protocol does not exclude the protection of marine living resources from its area of competence, which is, as stated above, the Antarctic ecosystem south of 60° South latitude. Although CCAMLR has pre-eminence in the conservation and management of marine living resources in Antarctica, and CCAMLR-regulated activities are exempted from some of the obligations imposed by the Protocol,⁸⁰ nevertheless, parties to the Environment Protocol have a clear responsibility to look after the entire Antarctic environment, which encompasses the marine environment and its living resources. Such a degree of responsibility assumed by the Antarctic Treaty and its Protocol over the whole Antarctic ecosystem should contribute significantly to enhancing the implementation of the ecosystem approach in Antarctica. This is, first, because the Protocol provides the tools for bringing into consideration a number of factors, such as maritime transportation, bioprospecting, tourism and deep-sea fishing, which can have an impact on the marine ecosystem but are beyond the scope of CCAMLR; second, because it can assist CCAMLR in implementing the ecosystem approach, within its area of competence, more effectively by providing scientific input from Antarctic advisory bodies such as the CEP and the Scientific Committee for Antarctic Research (SCAR); and finally because the Environment Protocol should operate as an “insurance” against any weakening of the environmental objectives of CCAMLR that could put at risk the adequate implementation of the ecosystem approach in Antarctica. The latter consideration becomes especially relevant in view of the expansion of Antarctic fisheries.⁸¹

⁷⁹ See: R. A. Sánchez and E. McIvor, “The Antarctic Committee for Environmental Protection: Past, Present and Future,” (2007) 43 *Polar Record* 239–246.

⁸⁰ Environment Protocol, Art. 4.2. Under the Final Act of the XIth ATCM in Madrid where the Environment Protocol was adopted, CCAMLR activities were exempted from having to conduct environmental impact assessments (EIA). See Final Act in (1991) 30 *I.L.M.* 1460–61. See Art. 8 of the Environment Protocol and Art. VII(5) of the Antarctic Treaty, which specify activities subject to EIA. Some scholars consider that exclusion of CCAMLR activities from an EIA should be interpreted restrictively and be limited strictly to fishing. Anything more than that would not be in accordance with an ecosystem approach in the CCAMLR Area. See commentary in L. Pineschi, *op. cit.*, *supra* note 37 at 278–280; see also R. A. Herr, *op. cit.*, *supra* note 77 at 7.

⁸¹ See: New Zealand, *CCAMLR in the Antarctic Treaty System*, Working Paper 14, ATCM (Antarctic Treaty Consultative Meeting) XXIX, 2006, text at www.ats.aq/devAS/info_measures_listitem.aspx?lang=e&id=363.

As agreed by the parties, CCAMLR is structurally related to the Antarctic Treaty. Although CCAMLR has its own mandate, CCAMLR bodies are required to coordinate their actions with relevant bodies of the ATS. CCAMLR specifically requires Contracting Parties that are not parties to the Antarctic Treaty to “acknowledge the special obligations and responsibilities of the Antarctic Treaty Consultative Parties for the protection and preservation of the environment of the Antarctic Treaty Area,” and to observe *as and when appropriate* the environmental measures recommended by the ATCPs.⁸² Therefore, it is clear from these provisions that the relationship between CCAMLR and the Environment Protocol is not only one of *cooperation*, but also of *hierarchical dependence* of CCAMLR with respect to the Antarctic Treaty and its Environment Protocol. The question arises whether this relationship results in the strengthening of the implementation of an ecosystem approach in Antarctica, or whether it leads to dilution of efforts or to lost opportunities.

Prospects for Integrated Management in the CCAMLR Area

The relationship between environment provisions in CCAMLR and the Antarctic Treaty, particularly the Environment Protocol, offers great opportunities for an integrated approach to the management of a wide range of activities that have an impact on Antarctic marine ecosystems. Current practice, however, indicates that much of the contribution that the relationship between these two regimes has to offer is yet to come. Cooperation between their bodies has focused on sharing information and has rarely touched upon substantive aspects.⁸³ Although CCAMLR formally recognizes the special obligations of the ATCPs for the protection of the Antarctic Treaty Area, it has never had an opportunity to receive much guidance on overall ecosystem protection from the ATCPs.

At recent meetings, both the Commission of CCAMLR and the ATCPs have given signs of awareness of the need to improve the level of cooperation between both regimes, while at the same time recognising the primacy of the ATCPs in environmental protection. At the XXIXth meeting of the ATCPs

⁸² CCAMLR, Arts. V.1 and V.2.

⁸³ The few exceptions have concerned CCAMLR receiving statements of support from the ATCMs on its efforts to combat IUU fishing, and some exchanges between CCAMLR and the CEP on questions related to the designation of MPAs, an issue where no substantial progress has been made. See: ATCM XXIII Resolution 3 (1999), ATCM SXII (Antarctic Treaty Special Consultative Meeting XII), Resolution 2 (2000), ATCM XXIV Resolution 2 (2001), and ATCM XXV Resolution 3 (2002). All these Resolutions are available at http://www.ats.aq/devAS/info_measures_list.aspx.

(XXIX ATCM) in 2006, New Zealand had questioned whether the level of mutual engagement between CCAMLR and the ATCM had been adequate for the health of the ATS,⁸⁴ and in response the ATCPs adopted a Resolution that encouraged increased cooperation at the practical level between the ATCM and CCAMLR.⁸⁵ In doing so, this Resolution recalled the “prime responsibilities” of the ATCPs for the protection and preservation of the Antarctic environment and the fact that CCAMLR is an integral part of the ATS.

Efforts are formally underway to enhance cooperation between CCAMLR and other ATS bodies, especially the CEP.⁸⁶ However, a number of issues, such as long-term monitoring and environmental protection of the Antarctic Treaty Area, have been singled out as requiring further attention.⁸⁷ Recollection by the ATCPs of their obligations with regard to the entirety of the Antarctic environment opens up opportunities for the further implementation of the ecosystem approach, particularly in view of the increasing influence of fishing interests on CCAMLR, which has not fully responded to some of the expectations held when the Convention was negotiated.⁸⁸

Other Regimes

CCAMLR is necessarily related to other international regimes of global and regional application. Due to the scope of this paper, it is not possible to address in detail the nature of such regime overlaps, nor their consequences. However, given the importance of understanding the need for CCAMLR to coordinate with other regimes if an ecosystem approach is to be fully implemented in Antarctic waters, some general considerations are necessary.⁸⁹

⁸⁴ See New Zealand, *op. cit.*, *supra* note 81.

⁸⁵ Resolution 1(2006). At the XXX ATCM in 2007, some ATCPs proposed the adoption of a Resolution on the threats posed by IUU fishing to the Antarctic Treaty Area, but consensus on it could not be reached. The ATCM limited itself to commending the work of CCAMLR on IUU fishing and reiterated the need to keep reflecting on CCAMLR's contribution to the ATS. See: XXX ATCM Report, paras. 44–48, text at http://www.ats.aq/devAS/info_finalrep.aspx?lang=e.

⁸⁶ See, for example, updates provided in CCAMLR Commission Reports under Agenda item “Cooperation with other elements of the Antarctic Treaty System”. Available at http://www.ccamlr.org/pu/e/e_pubs/cr/drt.htm.

⁸⁷ CCAMLR Commission, *op. cit.*, *supra* note 62 at para. 15.3; *Report of the Twenty-Third Meeting of the Commission for the Conservation of Antarctic Marine Living Resources (2004)*, paras. 13.8–13.10. Available at http://www.ccamlr.org/pu/e/e_pubs/cr/drt.htm.

⁸⁸ New Zealand, *op. cit.*, *supra* note 81.

⁸⁹ For an account of overlaps between CCAMLR and other regimes, see E. J. Molenaar, *op. cit.*, *supra* note 30. On a political science approach to regime overlap in the Southern Ocean, see R. Herr, “*Living Resource Management in the Southern Ocean: The Effects of Regime Overlap*,” (1996) *Polar Oceans Reports* 6 (Fridtjof Nansen Institute, Lysaker, 1996).

One category of overlapping regimes includes regimes with competence over specific migratory species which are found in the CCAMLR Area, such as albatrosses and petrels (i.e., Agreement on the Conservation of Albatrosses and Petrels (ACAP), of 2001),⁹⁰ bluefin tuna (i.e., Convention for the Conservation of Southern Bluefin Tuna (CCSBT), of 1993),⁹¹ and whales (i.e., International Convention for the Regulation of Whaling (ICRW), 1946).⁹² The formal relationship between CCAMLR and the International Whaling Commission (IWC), and between CCAMLR and ACAP has been clearly defined. CCAMLR gives “pre-eminence” to the IWC,⁹³ while CCAMLR is given pre-eminent status in the management of marine living resources in the context of ACAP.⁹⁴ In practical terms, however, greater co-operation should be achieved between these regimes, particularly with the IWC.⁹⁵ ACAP offers better prospects for positive cooperation with CCAMLR, especially in view of CCAMLR’s leadership on the reduction of incidental mortality of albatrosses and petrels as a result of fishing. At the regional level, a pending issue for CCAMLR is to establish clear terms of cooperation with the CCSBT to regulate fishing for Southern Bluefin Tuna (SBT) in the CCAMLR Area.⁹⁶

Another category of potentially overlapping regimes concerns those that can play a role in enhancing compliance. This is the case of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES),⁹⁷

⁹⁰ Agreement on the Conservation of Albatrosses and Petrels (ACAP), done at Canberra, 19 June 2001; in force 1 February 2004; amended, Second Meeting of the Parties, Christchurch, 13–17 November 2006, available at http://www.acap.aq/en/index.php?option=com_content&task=view&id=16&Itemid=34.

⁹¹ Convention for the Conservation of Southern Bluefin Tuna (CCSBT), done at Canberra, 10 May 1993; in force 20 May 1994, 1819 *U.N.T.S.* 360.

⁹² International Convention for the Regulation of Whaling (ICRW), Washington, 2 December 1946; in force 10 November 1948, 161 *U.N.T.S.* 72.

⁹³ CCAMLR, Art. VI. For a comparison of the CCAMLR and IWC regimes in the management of marine living resources, see K. H. Kock, “Antarctic Marine Living Resources—Exploitation and its Management in the Southern Ocean” (2007) 19 *Antarctic Science* 231–238.

⁹⁴ ACAP, Art. XIII.1.a).

⁹⁵ Scientific co-operation should be a first step to regime improvement through a better understanding of the dynamics of Antarctic ecosystems. A joint CCAMLR/IWC Workshop will be held in August 2008, in order to consider what kind of information is needed to develop models on the Antarctic marine ecosystem that would be useful for both organizations in providing management advice. Scientific Committee of CCAMLR, *op. cit.*, *supra* note 53, at para. 14.17.

⁹⁶ For a commentary on the relationship between the CCSBT and CCAMLR, and on considerations of regime overlap, see: A. Hemmings, “Regime Overlap in The Southern Ocean: The Case of Southern Blue Fin Tuna and CCSBT in the CCAMLR Area,” (2006) 3 *New Zealand Yearbook of International Law* 1–11.

⁹⁷ Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES), done at Washington, 3 March 1973, in force 1 July 1975, 993 *UNTS* 243.

whose regime offers the opportunity to enhance controls over illegally caught species. In 2002, Australia nominated toothfish to be listed under Appendix II of CITES. The proposed listing would have required all CITES parties to use CCAMLR's toothfish catch documents for toothfish exports and imports, significantly broadening the application of CCAMLR controls over IUU fishing and trade to non-CCAMLR parties. In spite of its substantial merits, this proposal failed, in great part due to a general resistance from fishing nations to grant commercial fish species protection under CITES, but also because most CCAMLR Members found coordination with CITES to be a difficult issue.⁹⁸

Compliance

Any new model of governance based on robust scientific input and integrated institutional mechanisms needs to be supplemented with effective compliance measures. Without effective compliance, all efforts to implement an ecosystem approach would remain useless. The CCAMLR example is a good illustration of this statement, as one of CCAMLR's greatest challenges concerns IUU fishing, particularly in the high seas of the Convention Area.

Currently, IUU fishing in the Antarctic targets two high-value species of toothfish (Patagonian and Antarctic), which are extremely vulnerable to over-exploitation. Vessels flagged to non-parties are mostly responsible for IUU fishing for toothfish, but CCAMLR Contracting Party vessels have also been engaged in such operations. In past years, the Commission has adopted a series of measures against IUU fishing that has placed this body at the forefront of international efforts to improve fisheries compliance. These measures include: requirements for marking fishing vessels and fishing gear,⁹⁹ licensing and inspection obligations,¹⁰⁰ port inspections,¹⁰¹ satellite vessel monitoring systems (VMS),¹⁰² IUU Vessel Lists,¹⁰³ and finally, what is probably the most

⁹⁸ See *Report of the Twenty-First Meeting of the Commission for the Conservation of Antarctic Marine Living Resources* (2002), at paras. 10.1–10.75. Available at <http://www.ccamlr.org/publications/cr/drt.htm>; see also E. J. Molenaar, *op. cit.*, *supra* note 30 at 473–74.

⁹⁹ CCAMLR Conservation Measure 10-01(1998), *supra* note 55.

¹⁰⁰ CCAMLR Conservation Measure 10-02 (2007), *supra* note 55.

¹⁰¹ CCAMLR Conservation Measure 10-03 (2005), *supra* note 55.

¹⁰² CCAMLR Conservation Measure 10-04 (2007), *supra* note 55.

¹⁰³ CCAMLR Conservation Measure 10-06 (2006), Scheme to Promote Compliance by Contracting Party Vessels with CCAMLR Conservation Measures, and 10-07 (2006), Scheme to Promote Compliance by non-Contracting Party Vessels with CCAMLR Conservation Measures, *supra* note 55.

sophisticated CCAMLR measure against IUU fishing, a Catch Documentation Scheme (CDS)¹⁰⁴ for toothfish. The CDS allows CCAMLR to track international trade in toothfish, and requires states participating in the scheme to verify the legality of the catch before allowing landings or imports of toothfish into their territories.¹⁰⁵

The evolving nature and complexity of IUU fishing have required CCAMLR bodies to improve and expand the package of measures adopted to promote compliance year after year. Some recent examples are the establishment of a centralised VMS—an essential piece in the effective implementation of the CDS¹⁰⁶—and the establishment of port state measures against vessels listed in CCAMLR’s IUU Vessel Lists,¹⁰⁷ which include provisions for denial of port access to listed vessels. The CCAMLR Commission has also adopted measures against nationals of its Members engaged in or supporting IUU fishing.¹⁰⁸ At the port and market state level, CCAMLR has developed a strategy to seek cooperation of relevant non-parties through their participation in the CDS, recognizing the status of Cooperating Non-Contracting Party for the purposes of the implementation of the CDS.¹⁰⁹

In spite of these continuous improvements, there continue to be gaps in the CCAMLR collective action against IUU fishing. For example, its system of inspection, established in 1998 in accordance with Article XXIV of the Convention, has been underutilised when compared with other organizations that regulate fisheries.¹¹⁰ While Members agree generally that the system needs improvements, they have been unable to reach consensus on which reforms would make the system more effective.¹¹¹ They have also had difficulties in incorporating trade-related measures against non-complying states, where

¹⁰⁴ CCAMLR Conservation Measure 10-05 (2006) on Catch Documentation Scheme for *Dissostichus* spp., *supra* note 55.

¹⁰⁵ For a detailed description of CCAMLR measures against IUU fishing, see D. G. M. Miller, E. N. Sabourenkov and D. C. Ramm, “Managing Antarctic marine living resources: the CCAMLR approach,” (2004) 19(3) *International Journal of Marine and Coastal Law* 317–363.

¹⁰⁶ CCAMLR Conservation Measure 10-04 (2007) on Automated satellite-linked Vessel Monitoring Systems (VMS), *supra* note 55.

¹⁰⁷ See CCAMLR Conservation Measure 10-06 (2006) and 10-07 (2006), *supra* note 55.

¹⁰⁸ CCAMLR Conservation Measure 10-08 (2006) on Scheme to promote compliance by Contracting Party nationals with CCAMLR conservation measures, *supra* note 55.

¹⁰⁹ CCAMLR Conservation Measure 10-05 (2006), ANNEX 10-05/C, *supra* note 55.

¹¹⁰ R. Arnaudo, “A short history of CCAMLR: A unique management and conservation regime,” presentation made at CCAMLR Symposium, Universidad Austral de Chile, Valdivia, Chile, 5–8 April 2005, available at www.aad.gov.au/default.asp?casid=21481 (individual presentations of Volume 2).

¹¹¹ Commission, CCAMLR *op. cit.*, *supra* note 62, paras. 13.79–13.82.

CCAMLR lags behind other regional bodies with competence over fisheries, such as ICCAT,¹¹² and in entering into cooperation arrangements with other regimes for the purposes of enforcement, such as the sharing of IUU Vessel Lists.¹¹³

A negative aspect of the application of the rule of consensus in CCAMLR is that enforcement measures against Contracting Parties to CCAMLR, such as, for example, the listing of Contracting Party vessels in the IUU Vessel List, require the support of *all* Members of the Commission for their adoption. Consequently, any opposition by the flag state of the infringing vessel prevents its being listed.

To conclude, it has to be noted that the Commission has made significant efforts to address IUU fishing in the Convention Area, including the adoption of a wide range of measures. Nevertheless, it has not been able to bring IUU fishing under control. IUU fishing for toothfish continues to pose a major threat to the health of Antarctic marine ecosystems. CCAMLR has tools in place to intensify its collective action against IUU fishing, and improve compliance with CCAMLR conservation measures across the whole Convention Area, especially on the high seas.¹¹⁴

Marine Protected Areas (MPAs): A Pending Issue for CCAMLR

The term ‘MPA’ refers to a management and conservation tool that encompasses a range of options, from strictly protected to multiple-use areas, with various options and combinations in between.¹¹⁵ The establishment of MPAs is increasingly being considered as an important complementary tool to traditional fisheries management measures, and as one of the most tangible means

¹¹² See ICCAT, Resolution by ICCAT concerning Trade Measures, 2003. Available at <http://www.iccat.int/Documents/Recs/compendiopdf-e/2003-15-e.pdf>.

¹¹³ At the XXVI Meeting of the CCAMLR Commission, Norway proposed the sharing of IUU vessels lists with other regimes. The proposal was rejected. See CCAMLR Commission, *op. cit.*, *supra* note 62 at para. 2.58.

¹¹⁴ Unilateral measures taken by coastal and market states have proven to be an effective deterrent. As a result of increased surveillance in CCAMLR’s EEZs, IUU operators are increasingly moving to high seas areas within CCAMLR, where enforcement actions are more difficult to implement.

¹¹⁵ The CBD defined a MPA as “any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna, historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine and /or coastal biodiversity enjoys a higher level of protection than its surroundings.” CBD COP7, 2004, Decision VII/5, available at www.cbd.int/decisions/cop-07.shtml?m=COP-07&id=7742&lg=0.

for achieving ecosystem-level conservation. Specifically, MPAs, if adequately designed and implemented, provide an opportunity to fulfil both broader conservation goals and fisheries management objectives,¹¹⁶ which is precisely what CCAMLR aims to achieve.

Article IX of CCAMLR specifies the ways to give effect to the conservation principles of Article II and in particular contemplates the opening and closing of areas, regions or sub-regions for purposes of scientific study or conservation, including special areas for protection and scientific study. This provision suggests that the long-term protection of marine areas that are representative of Antarctic ecosystems falls fully within CCAMLR's mandate. In addition, these provisions need to be read in the context of the environmental protection values of the Antarctic Treaty, and specifically the Environment Protocol and its provisions for area protection.

The Environment Protocol identifies two types of protected areas, depending on the degree of protection they receive: "Antarctic Specially Protected Areas" (ASPAs)¹¹⁷ and "Antarctic Specially Managed Areas" (ASMAs).¹¹⁸ The Protocol establishes that for the designation of either marine area it is necessary to obtain prior approval from CCAMLR's Commission.¹¹⁹

The important role granted to CCAMLR by the ATCPs in this process has the potential to strengthen CCAMLR's conservation mandate and to encourage a mutually supportive role of CCAMLR and the Environment Protocol for the conservation of environmental, aesthetic and ecosystemic values of Antarctica. However, the fulfilment of these mutually supportive roles by CCAMLR and the Environment Protocol is yet to be realised. Article 3 of Annex V of the Environment Protocol identifies criteria to establish a series of ASPAs, including representative examples of major terrestrial and marine ecosystems. Overall, these criteria are fully consistent with CCAMLR Article II,¹²⁰ and yet no

¹¹⁶ See H. I. Browman and K. I. Stergiou, "Marine Protected Areas as a Central Element of Ecosystem-Based Management: Defining their Location, Size and Number," (2004) 274 *Marine Ecology Progress Series* 271–272.

¹¹⁷ Article 3, Annex V (Area Protection and Management).

¹¹⁸ Article 4.

¹¹⁹ Environment Protocol, Article 6.2. Decision 9 (2005) lays out the criteria for submission of draft ASPAs and ASMAs to CCAMLR. Draft management plans which require the prior approval of CCAMLR are those: (a) in which there is actual harvesting or potential capability of harvesting of marine living resources which might be affected by site designation, and (b) for which there are provisions specified in a draft management plan which might prevent or restrict CCAMLR-related activities. Decision 9 (2005), XXVIII ATCM, Stockholm, Sweden, May 2005, text at www.ats.aq/devAS/info_measures_listitem.aspx?lang=e&id=344.

¹²⁰ Report of the CCAMLR Workshop on Marine Protected Areas, Silver Springs, MD (USA), 29 August–1 September 2005, at para. 66, available at www.ccamlr.org/pu/e/e_pubs/sr/05/a7.pdf.

ASPAs with a substantial marine component have so far been designated in high seas within the CCAMLR Area.¹²¹

Under CCAMLR, the only areas that have been given the title “protected” under CCAMLR are CEMP sites. However, their significance for the preservation of marine ecosystems is minimal, because their main purpose is to protect and facilitate monitoring of land-based colonies of krill predators. CEMP sites may be given protected status under conservation measures and, as such, require a permit for entry.¹²²

There is some tension between ATCM and CCAMLR bodies over the implementation of the protected areas provisions in the ATS.¹²³ Some Members of the Commission have given a narrow interpretation to CCAMLR’s conservation mandate and the obligation under Article V (2) to abide by the environmental protection measures recommended by the ATCPs. This has hindered the development of harmonised approaches to MPAs in the region.

In 2007, the Commission of CCAMLR agreed to endorse a proposal to create an ASMA with a significant marine component in the Southwest Anvers Island and Palmer Basin. Although the Commission demanded clarification from the ATCM that the Anvers Island management plan will

¹²¹ Only some CCAMLR Members with jurisdiction over EEZs around sub-Antarctic islands have designated MPAs within those EEZs and in the area of application of CCAMLR. A notable example is the Heard and McDonald Islands Marine Reserve, declared by Australia. Work is also underway towards the declaration of a large MPA around South Africa’s sub-Antarctic Prince Edward Islands. See: CCAMLR Workshop on Marine Protected Areas, *ibid.*, paras. 48–57 and 72–82.

¹²² So far, only two CEMP sites have been afforded protection, one of which (*Cape Shirreff*) has also been designated as an ASPA under the Environment Protocol, and the other has lapsed due to the cessation of research activities at the site. There is scope for additional CEMP sites to be designated as ASPAs, and for further co-ordination between the CCAMLR and the Environment Protocol systems in terms of strategic area selection for the study and protection of land-based predator sites. See: CCAMLR Conservation Measure 91-01 (2000), Procedures for According Protection to CEMP sites; CCAMLR Conservation Measure 91-02 (2004), Protection of the Cape Shirreff CEMP Site; and CCAMLR Conservation Measure 91-03 (2004), Protection of the Seal Islands CEMP Site, rescinded in 2007. See for all *supra* note 55.

¹²³ New Zealand’s proposal for an expanded ASPA around the Balleny Islands has been the only substantial initiative for a relatively large MPA within the CCAMLR Area outside an EEZ, and the Commission of CCAMLR has been unable to endorse this proposal. See *Report of the Nineteenth Meeting of the Commission for the Conservation of Antarctic Marine Living Resources (2000)*, text at http://www.ccamlr.org/pu/e/e_pubs/sr/drt.htm, paras. 11.10–11.28. The correct terminology at the time of the designation of the ASPA was SPA. SPA no. 4, around Sabrina Island, was designated in 1996. No management plan has been agreed yet for Sabrina Island. See Summary of ASPA No. 104. Sabrina Island, Balleny Islands (formerly SPA No. 4), at <http://cep.ats.aq/cep/apa/aspasites/aspa104/summary.html>.

permit fishing activities within the ASMA, this case may open up a new phase of closer interaction between CCAMLR and the ATCPs for the establishment of MPAs across the AT Area.¹²⁴

Another significant development is an initiative by CCAMLR's Scientific Committee to undertake a bioregionalisation¹²⁵ of the Southern Ocean as a technical step towards the establishment of a representative system of MPAs in the CCAMLR Area.¹²⁶ As CCAMLR moves deeper into its bioregionalisation process, the challenge will be to achieve an active and constructive dialogue between CCAMLR bodies and the rest of the ATS that aims at developing a harmonised regime for the protection of the marine environment across the Antarctic Treaty Area, especially on the high seas.

Administration and compliance issues related to the implementation of MPAs in the Antarctic Treaty Area also will need to be addressed. While CCAMLR has the primary responsibility for managing fishing activities in the Area, the establishment of legitimate and effective administration mechanisms for Antarctic high seas MPAs has higher political implications, and will also require the limitation of other activities that are not under CCAMLR's scope. It will be therefore necessary to deal with these issues at the highest level of the ATS in order to come up with effective solutions that are acceptable for all CCAMLR Members and ATCPs.

Conclusions

The ecosystem approach is gradually being accepted as an instrument for the conservation and management of natural resources, particularly with regard to marine ecosystems. Its implementation requires the incorporation of new paradigms, not only scientific but also institutional. From a scientific perspective, the ecosystem approach involves, *inter alia*:

¹²⁴ The proposal had been forwarded to CCAMLR by the ATCPs for comment under Decision 9 (2005). The management plan can now be considered for adoption by the ATCM. See Scientific Committee of CCAMLR, *op. cit.*, *supra* note 53, at para.15.41–15.49.

¹²⁵ In this context, the term "bioregionalization" refers to a zoning or partition of ocean areas for the purposes of large-scale ecological modelling, ecosystem-modelling, ecosystem-based management, and consideration of marine protected areas. See S. Grant, A. Constable, B. Raymond and S. Doust, *Bioregionalisation of the Southern Ocean: Report of Experts Workshop*, Hobart, September 2006 (WWF-Australia and Antarctic Climate and Ecosystems Cooperative Research Centre, Sydney, Australia), at 3.

¹²⁶ See *Report of the Twenty-Fifth Meeting of the Scientific Committee for the Conservation of Antarctic Marine Living Resources* (2006). Text at <http://www.ccamlr.org/pu/el/epubs/sr/drt.htm>.

- a) definition of objectives in relation to the state and functioning of the ecosystems; management based on the best scientific information available on ecosystem dynamics;
- b) adaptive management through research and monitoring;
- c) preservation of biodiversity, which also includes the establishment of marine protected areas; and
- d) long-term management of current and anticipated combined impact of human activities.

Institutionally, it requires integrated policies and assessments, and involvement of relevant stakeholders. As illustrated by the analysis of the implementation of the ecosystem approach in CCAMLR, such a new paradigm of ocean management also needs to be accompanied by effective compliance mechanisms that ensure that the efforts made do not remain useless.

Overall, CCAMLR has made significant efforts towards the implementation of these new scientific, institutional and compliance elements. However, current practice also indicates that in the face of increased pressures from fishing, CCAMLR may have to engage in greater efforts if it is not to abandon the core conservation principles that shaped this regime at its inception.

At the scientific level, CCAMLR presents a robust set of scientific bodies and mechanisms. However, the ecosystem approach places science at the centre of management considerations, and it is of the essence that greater resources are dedicated to the development and continuous incorporation of scientific information on ecosystem dynamics. It is also a priority that scientific input is at all times authoritative and independent. A drawback of the system is that CCAMLR has not been able to slow down the continuous expansion of regulated fisheries, which may be growing at a faster rate than warranted by the acquisition of data. This limits CCAMLR's ability to ensure the precautionary management of these fisheries, and questions whether decisions on the Antarctic ecosystem respond to the state and functioning of this ecosystem, or to other needs.

In the area of ecosystem-based management of specific fisheries, much progress has been made, but the implementation of adaptive, feedback-management regimes still needs to be further developed, especially to address the combined impacts of fishing and climate change. For these management approaches to be successful, important scientific investments will be required, and fishing effort needs to be limited according to CCAMLR's management capabilities at each stage of the process. Finally, CCAMLR has still not responded adequately to its mandate to declare closed areas for the purposes of protection and scientific study, although it is working on the scientific basis

for the establishment of a representative network of MPAs through its bioregionalisation of the Southern Ocean. An opportunity now arises for CCAMLR to work towards a harmonised system of Antarctic protected areas, in association with the ATCPs.

At the institutional level, CCAMLR has made efforts to reach out to other organizations and non-Members, by seeking their cooperation in the implementation of CCAMLR measures, such as the CDS or by-catch mitigation rules. However, it has had trouble accepting the complementarity of global, far-reaching instruments such as CITES, or engaging in less exigent efforts, such as taking into consideration IUU Vessel Lists from other RFMOs. Closer integration with other bodies of the ATS is also needed if an integrated approach to the Antarctic is to be achieved. Currently, there is technical cooperation between CCAMLR and Antarctic Treaty bodies, but government representatives generally seem reluctant to acknowledge the special position of CCAMLR within the ATS, and the primary role of the ATCPs in the conservation of the entire Antarctic environment. In this context, while it is commendable for CCAMLR to open up its membership to new states, it is important that these new members understand that they are bound by CCAMLR's conservation principles, which need to be read in the light of the environmental goals of the Antarctic Treaty, and especially of the Environment Protocol. For the sake of harmonisation, it would be advisable that all parties to CCAMLR that are entitled to become parties to the Antarctic Treaty and its Environment Protocol do so at their earliest opportunity. In addition, greater cooperation between CCAMLR bodies and those bodies responsible for the implementation of the Protocol, especially the CEP, should be promoted, with the specific goal of achieving a harmonised protection regime for the Antarctic marine and terrestrial ecosystems, including a representative network of protected areas.

On compliance, CCAMLR has adopted a wide-ranging set of measures against IUU fishing. However, it has not yet managed to bring these activities under control, and they continue to pose a threat to the achievement of the Convention's objectives, especially on high seas areas. Greater involvement of non-Contracting Parties, albeit difficult, is an essential aspiration. In relation to decision-making, the consensus rule can prove to be problematic when dealing with compliance issues, because it can allow Members to block the adoption of uncomfortable measures. A solution is particularly necessary when addressing specific IUU fishing cases where CCAMLR Members are involved.

On the whole, although CCAMLR conservation principles have the potential to operate as an insurance against the over-exploitation of Antarctic

living resources, the delicate balance between conservation and rational use is becoming increasingly difficult as fisheries interests continue to grow, and the seas around Antarctica are gradually opened up to industrial fishing. Furthermore, the role of the consensus rule as a balancing factor between these two interests may be doomed, as the proportion of fishing Members will outnumber non-fishing Members. Nevertheless, CCAMLR still has a chance to maintain this balance, to further implement the ecosystem approach and establish a realisable model for regional ocean governance in the area of living resources management.

Lessons from CCAMLR should be considered by other regional bodies with competence over high seas resources in relation to the implementation of ecosystem and precautionary approaches in their respective regimes. The ecosystem approach requires balancing conservation and use in order to maintain the integral functioning of ecosystems while allowing the development of human activities. It is this balance, which lies at the core of CCAMLR, that has made this Convention unique. RFMOs would benefit from adopting CCAMLR's formulation of an ecosystem approach if they are to maintain those ecosystems that support commercial fisheries.

From a scientific perspective, determination of the appropriate scope of application of the ecosystem approach is essential. CCAMLR's area of competence covers the whole Southern Ocean, thus responding to ecosystemic criteria and not to merely political factors. It also aims to conserve all elements in the ecosystem and not only those species that support important fisheries. Unless non-ecosystem-based regional fisheries regimes become adequately coordinated with other regimes having an impact on the same ecosystem (and are eventually replaced in some of their competences by centralised levels of management competent over a single ecosystem), their management will fail to fully adopt an ecosystem approach.

The ecosystem approach relies fundamentally on very strong scientific inputs. At the international level, this requires commitment from states to share as much information as possible, as well as investing in adequate research programs. In addition, precaution and adaptive management need to be applied in order to incorporate the uncertainty and complexity that ecosystem-based management entails.

At the institutional level, coordination is the key word. If coordination among different institutions with competence over marine areas is a challenge at the national level, coordination among regimes with competence over high seas resources will be even more difficult. Nonetheless, effective coordination is unavoidable if ecosystem-based management objectives are to be achieved. Such coordination should occur not only on an *ad hoc* basis, but should be

structurally ingrained. CCAMLR provides a simpler model than that possibly required for most RFMOs if they were to seek an integrated approach to ocean management policies. The institutions of the ATS, although underutilised, provide a solid framework whose sole objective is to look after Antarctica. Such a structure is unique. RFMOs and other regional arrangements with competence over high seas areas need to find creative ways to enhance coordination mechanisms with other instruments. Some notable examples at the regional level already exist.¹²⁷ CCAMLR's apparently simpler model also reveals the difficulties in integrating approaches to conservation in the face of divergent interests, even in the context of a relatively cohesive regime such as the ATS. On decision-making, consensus contributes to preserving the original mandate of the agreement by balancing concerns, but also hampers progress at times. The more dynamic decision-making structures of other international fishery bodies could be positive if they are preserved after the adoption of conservation goals in their regimes.

The occurrence of IUU fishing is almost inevitable for all RFMOs, especially on high seas areas. CCAMLR provides a good model of the range of measures that need to be adopted in order to deter these activities. Unfortunately, the CCAMLR case also shows that measures can be ineffective unless they are comprehensive, and also effectively enforced against all those who support IUU activities. Concerted action with other regional and global bodies with competence over fishing and trade is necessary.

Lessons from CCAMLR relate not only to its successes but also to its weaknesses. Implementation of the ecosystem approach, especially in ocean areas beyond national jurisdiction, is a very ambitious goal and its achievement will not be possible without obstacles and difficulties. The latter are part of the process, and should not be regarded as failures, but as challenges that need to be properly acknowledged and addressed. CCAMLR's experience in this sense is very valuable, even if it is itself still struggling to succeed.

¹²⁷ For example, HELCOM/OSPAR coordination efforts. See: 2003 Joint HELCOM/OSPAR Statement, *op. cit.*, *supra* note 11.