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Conservation and Sustainable Use of Arctic Marine Biodiversity:

Challenges and Opportunities

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Abstract: The status of the marine Arctic as 'the last wilderness' may be challenged in future by increased activities provided by the melting of the sea ice. The fragile ecosystems and habitats may come under threat. In this article the international law on conservation and sustainable use of marine biodiversity is explored where the *ecosystem approach* has been developed, and these legal and semi-legal norms are related to the marine Arctic. Particularly challenging is to implement the ecosystem approach within the maritime jurisdiction. Although still a wilderness, state practice indicates that implementation will not be any easier in the Arctic, and that it will not become a laboratory for new legal regimes. Most likely sectoral regulatory regimes will be extended or developed as different threats materialize. One of the main challenges will be to ensure proper coordination between these to apply the ecosystem approach.

Keywords: Arctic, international environmental law, biodiversity, law of the sea

1. Introduction

Biodiversity and *ecosystem* were introduced as legal terms in international law through the 1992 Convention on Biodiversity (hereafter also CBD).[2] The concepts have subsequently been included in international fisheries law such as the

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2. Convention on Biological Diversity, adopted 5 June 1992, in force 29 December 1993, 1760 UN *Treaty Series*, p. 29 ff.

1995 Fish Stocks Agreement (hereafter also FSA)[3] and regional seas conventions such as the OSPAR Convention.[4] The prevailing approach to the regulation of human activities in international environmental law has been and still is sectoral. The 1982 UN Convention on the Law of the Sea (hereafter LOS Convention) provides a good example, as states have separate obligations on the conservation and management of living marine resources and on protection and preservation of the marine environment.[5] Furthermore, the obligation to protect the environment is separated into several obligations dependent on the sources of pollution, such as shipping, petroleum activities and land-based activities. The biodiversity and ecosystem concepts add more holistic perspectives to conservation and management of the marine environment, expressed through concepts such as the ecosystem approach. Applying the ecosystem approach would imply that states assess and manage the cumulative effects of different human activities (e.g. fishing and pollution) and natural variations in context.

The main objective of this article is to present and assess obligations on the conservation and sustainable use of biodiversity and the implications for the ma-

3. 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, in force 11 December 2001, United Nations, *Treaty Series*, vol. 2167, p. 3ff, Article 5 (g).

4. Convention on the Protection of the Marine Environment of the North–East Atlantic Annex V on the protection and conservation of the ecosystems and biological diversity of the maritime area, Paris, 22 September 1992, in force 25 March 1998, United Nations *Treaty Series*, vol. 2354, p. 70 ff.

5. United Nations Convention on the Law of the Sea, 10 December 1982, in force 16 November 1994, United Nations, *Treaty Series*, vol. 1833, p. 3 ff. Obligations on living marine resources are found in Part V (Article 61) and Part VII (Article 119), while obligations to prevent pollution from different sources are regulated in Part XII.

rine Arctic.[6] The CBD and a series of international environmental agreements are applicable to the conservation of the Arctic marine biodiversity.[7] This includes a discussion on the implications for the governance of the marine Arctic. The law of the sea is undoubtedly applicable to the Arctic Oceans and seas.[8] This was also highlighted by the five Arctic coastal states in their May 2008 Ilulissat Declaration.[9] These maritime areas are subjected to different legal regimes, from the territorial sea subjected to the sovereignty of coastal states, the exclusive economic zone where the coastal state enjoys sovereign rights to the natural resources, and other states have freedom of navigation to the high seas where all states enjoy

6. There is no legal definition of the Arctic and consequently not of what constitutes the marine Arctic, according to Alf Håkon Hoel, "Do We Need a New Legal Regime for the Arctic Ocean?", *The International Journal of Marine and Coastal Law*, vol. 24, 2009, pp. 443–456, at p. 444, Rosemary Rayfuse, "Melting Moments: The Future of Polar Oceans Governance in a Warming World", *Review of European Community & International Environmental Law*, vol. 16 no. 2 (2007), pp. 196–216, at p. 197 and Timo Koivurova and Erik J. Molenaar, *International Governance and Regulation of the Marine Arctic. Overview and Gap Analysis*, WWF International Arctic Programme, Oslo, Norway, 2009, p. 11, available on www.panda.org/what_we_do/where_we_work/arctic/publications/?154981/Arctic-protection-gaps-identified-in-new-WWF-report.pdf (April 2010). Different definitions have been used and by different institutions. The definition used by the Arctic Monitoring and Assessment Programme (AMAP) under Arctic Council, available at http://amap.no/ is to include the Arctic Ocean and adjoining seas. This paper will make no further attempts to define the marine Arctic.

7. Linda Nowlam, *Arctic Legal Regime for Environmental Protection*. IUCN: Gland, 2001, pp. 16–39; Multilateral Environmental Agreements and their relevance to the Arctic. Overview Report, Grid Arendal, September 2006, available on www.grida.no/polar/activities/2474.aspx (April 2010).

8. Louise Angélique de la Fayette, "Oceans Governance in the Arctic", The International Journal of Marine and Coastal Law, vol. 23, 2008, pp. 531–566, at pp. 531–533 on the controversy following the lowering of the Russian flag on the North Pole; Donald R. Rothwell and Christopher C. Joyner, "The Polar Oceans and the Law of the Sea" in Alex G. Oude Elferink and Donald R. Rothwell (eds.), *The Law of the Sea and Polar Delimitation and Jurisdiction*, Kluwer Law International: the Hague, 2001, pp. 1–22, at. pp. 1–2; Rosemary Rayfuse, "Warm Waters and Cold Shoulders: Jostling for Jurisdiction in Polar Oceans ", the *Yearbook of Polar Law*, vol. 1, 2009, pp. 465–477, at pp. 471–474; Timo Koivurova and Erik J. Molenaar, *supra* note 6, pp. 13–15.

9. The 5 Arctic Coastal states include Canada, Denmark (in respect of Greenland), Norway, Russian Federation and USA. The declaration is available on the webpages of the Danish Foreign Ministry, http://www.um.dk/NR/rdonlyres/BE00B850-D278-4489-A6BE-6AE230415546/0/ArcticOceanConference.pdf%22 (April 2010).

freedoms such as fishing and navigation.[10] As will be discussed, protection of marine biodiversity requires coordination and co-operation between states across jurisdictions and freedoms and sectors to maintain the functioning and productivity of the 17 large marine ecosystems identified in the Arctic.[11] The question is how to ensure this within the framework set by the law of the sea.

As indicated by the title it will be demanding to operationalize or to transfer biodiversity into a legal context. Marine biodiversity and the associated ecosystems are dynamic, both in time and space, and disregard state jurisdictions. This will require the law to be flexible, not only in respect of the selection of types of measures, but also in their geographical and temporal areas of application. Therefore a presentation and discussion of the general obligations is required before the Arctic issues may be addressed.

The paper has the following outline: Section 2 gives a brief introduction to biodiversity, its importance, and status and trends in the Arctic. Section 3 will include the two objectives of the CBD on the conservation and sustainable use of biodiversity, and the obligations developed through the CBD and the Fish Stocks Agreement to implement them, linked to the concept of the ecosystem approach. The implementation of these obligations to the marine Arctic will be presented and assessed in section 4. The question of how more holistic perspectives to conservation and protection of the marine Arctic biodiversity may be introduced is discussed separately in section 5, before conclusions are drawn in section 6.

2. Biodiversity: Importance and trends

Biodiversity may broadly be described as the variety of life.[12] It is defined in Article 2 of CBD to include diversity at a genetic level (between individuals within a population), between species, and diversity of ecosystems, including marine. Biodiversity involves both quantitative and qualitative elements: Diversity is more

10. LOS Convention Article 2 (territorial sea), Articles 56 and 58 (Exclusive Economic Zone) and Article 87 (High Seas). The coastal states also enjoy sovereign rights over natural resources of the sea bed and subsoil of the continental shelf which may extend beyond 200 nautical miles, LOS Convention Articles 77 and 76.

11. Kenneth Sherman, Marie-Christine Aquarone and Sally Adams, "Global Applications of the Large Marine Ecosystem Concept 2007 – 2010", *NOAA Technical Memorandum NMFS-NE-208*, US Department of Commerce, National Oceanic and Atmospheric Administration, Northeast Fisheries Science Center Woods Hole, June 2007, pp. 27–28, available on www.lme.noaa.gov/LMEWeb/Publications/tm208.pdf (April 2010).

12. *The fourth Global Environment Outlook: environment for development*, United Nations Environment Programme, 2007, p. 150, available on www.unep.org/geo/geo4/media (April 2010).

than the numbers of individuals of a population or of species. It also involves the variation and distribution within a species and between species.[13] The concept is evidently more varied than the concepts of 'environment' used in the LOS Convention.[14] The rationale for conserving biological diversity is found in the preamble of the CBD which reflects both ecocentrism and anthropocentrism or utilitarianism:[15] Biodiversity has intrinsic value. The conservation of biodiversity is important because of the benefits provided by the different functions of ecosystems to humans. These are described as (direct and indirect) ecosystem services, which include provisioning services (food, water, timber, and fiber), regulating services (regulation of climate, floods, disease, wastes, and water quality), supporting services (biomass production, photosynthesis, nutrient and water cycling, and soil formation and retention) and cultural services (recreation, aesthetic enjoyment, and spiritual fulfillment).[16]

Reports describe the loss of biodiversity as continuing.[17] Virtually all ecosystems have been affected by human activities.[18] Habitats and ecosystems have been affected, for example, by transformation to farmland and destruction of coral reefs. The rates of species extinction are 100 times higher than the baseline rate shown by the fossil record. There are both direct and indirect drivers of these changes. The direct drivers include climate change, pollution, overexploitation and invasive species.[19] Fishing is identified as the most important driver of change of marine ecosystems over the past 50 years.[20]

In contrast the marine Arctic ecosystems are considered to be generally in good condition, and in vast areas the impact of human activity is still insignificant.[21]

13. Millennium Ecosystem Assessment. Ecosystems and Human Well-being: Biodiversity Synthesis. World Resources Institute, Washington, DC, 2005, p. 20, available on www.millenniumassessment.org/en/Synthesis.aspx (April 2010).
14. LOS Convention Article 192 is one of several provisions where the object of protection is the environment, which is not defined.
15. Klaus Bosselmann, *The Principle of Sustainability: Transforming Law and Governance*, Ashgate: Farnham, 2008, pp. 160–161.
16. Millennium Ecosystem Assessment, 2005, pp. 21–29.
17. Millennium Ecosystem Assessment, 2005, pp. 42–47; *The fourth Global Environment Outlook: environment for development*, United Nations Environment Programme, 2007, p. 162, available on www.unep.org/geo/geo4/media (April 2010).
18. Millennium Ecosystem Assessment, 2005, p. 42.
19. Millennium Ecosystem Assessment, 2005, pp. 47–59.
20. Millennium Ecosystem Assessment, 2005, p. 51.
21. CAFF. *Arctic Flora and Fauna. Status and Conservation*. Helsinki: Edita, p. 255, available at http://arcticportal.org/en/caff/arctic-flora-and-fauna2 (29 April 2008); Louise McRae et al., *Arctic Species Trend Index 2010: Tracking Trends in Arctic Wildlife*. CAFF CBMP Report No.20, CAFF International Secretariat, Akureyri, Iceland, 2010, p. 27.

However, the biological diversity of the region is subjected to the same environmental threats as other regions.[22] Persistent organic pollutants (POPs) and heavy metals transported through the atmosphere and sea from external sources also have negative effects on Arctic biodiversity.[23] There are scientific uncertainties as to how marine ecosystems will respond to climate changes.[24] Effects may include increased sea temperature and acidification. Rising sea temperature may increase the productivity of some species and introduce new species to the ecosystems, while other species such as sea birds and marine mammals may be threatened by climate change.[25] The effects of climate change have to be considered together with other factors affecting biological diversity, such as long-transported transboundary pollutants, and the effects of increased use of the Arctic following the further retreat of sea ice and snow. The projections of the 2004 Arctic Climate Impact Assessment[26] have been revised to reflect the melting of sea ice at a higher speed.[27] It means more of the previously inaccessible Arctic may be used, and earlier than previously anticipated. The ACIA report assessed the effects of human activities such as harvesting of living marine resources, pollution from different sources including trans-Arctic shipping, and petroleum and land-based operations.[28] However, questions may be raised on the practicality of such activities in the short term. The Arctic Marine Shipping Assessment Report presents scenarios of increased regional shipping, but doubts are raised about prospects of trans-Arctic shipping before 2020.[29] An estimated 22 % of undeveloped petroleum resources are to be found in the Arctic. These estimates are fraught with uncertainty, and in any case the areas will not be easily accessed due to continuing sea ice and harsh climactic

22. Rosemary Rayfuse, "Protecting Marine Biodiversity in Polar Areas Beyond National Jurisdiction", *Review of European Community & International Environmental Law*, vol. 17 (1), 2008, pp. 3–13 at p. 5.
23. AMAP, 2009, *Arctic Pollution 2009*, Arctic Monitoring and Assessment Programme, Oslo.
24. Harald Loeng, Geir Ottersen, Martin-A. Svenning and Audun Stien, *Effekter på økosystemer og biologisk mangfold: Klimaendringer i norsk Arktis. NorACIA delutredning 3*, Norwegian Polar Institute Report series no. 133, Tromsø 2010, p. 24.
25. ACIA. Arctic Climate Impact Assessment Scientific Report, Cambridge University Press: Cambridge, 2005, pp. 544–546; Loeng et al, *supra* note 24, pp. 24–25.
26. ACIA, *supra* note 25, p. 100.
27. *Global Outlook for Ice and Snow*, United Nations Environmental Programme, 2007, p. 72–74, available on www.unep.org/geo/geo_ice/PDF/full_report_LowRes.pdf (April 2010).
28. ACIA, *supra* note 25, pp. 560–567.
29. Arctic Council. *Arctic Marine Shipping Assessment 2009 Report*. Arctic Council, April 2009, second printing, pp. 102–104.

conditions.[30] However, as recognized in the Arctic Impact Assessment Report, there is a need for increased knowledge about Arctic biodiversity, and to monitor the effects of climate change and other activities on the region.[31] This will prepare the way for recommended guidelines to "… manage all aspects of the Arctic's biodiversity … "[32]

3. Conservation and sustainable use of biodiversity: Towards an ecosystem approach

3.1 Filling a lacunae but possible to translate into law?

The Convention on Biological Diversity is undoubtedly the most widely accepted multilateral environmental agreement. It has 193 States Parties, including the European Union.[33] With the exception of the USA, all eight Arctic States are States Parties to the CBD.[34]

The CBD was formed in recognition of the need to expand the existing protection established through global and regional environmental conventions.[35] The protection of single species was inadequate to conserve biological diversity. According to Birnie, Boyle and Redgwell[36] the CBD is the "… first attempt to deal with the lacunae arising from the old system by establishing a more comprehensive and inclusive regime for conservation of biodiversity as such." As stated in the

30. According to the 2008 United States Geological Survey an estimated 22 % of undiscovered oil and gas reserves are found in the Arctic., available on http://www.usgs.gov/newsroom/article.asp?ID=1980&from=rss_home (April 2010). As pointed out by Tavis Potts and Clive Schofield, "An Arctic Scramble? Opportunities and Threats in the (Formerly) Frozen North", *The International Journal of Marine and Coastal Law*, vol. 23, 2008, pp. 151–176, at p. 154 in their comments to the corresponding 2000 Survey at not being based on serious exploration these estimates are highly uncertain.
31. ACIA, *supra* note 25, pp. 580–589.
32. *Ibid*.
33. An overview of the status of the CBD is available on http://www.cbd.int/convention/parties/list/ (April 2010).
34. The Arctic States include the eight member states of the Arctic Council: Canada, Denmark (on behalf of the Faroe Islands and Greenland), Finland, Iceland, Norway, Russian Federation, Sweden and USA.
35. Catherine J. Tinker, "A New Breed of Treaty: The United Nations Convention on Biological Diversity", *Pace Environmental Law Review*, 12 (2), 1995, pp. 191–218 at pp. 195–196.
36. Patricia Birnie, Alan Boyle, Catherine Redgwell, *International Law & the Environment*, 3rd ed. Oxford: Oxford University Press, 2009, p. 613.

1982 World Charter for Nature: "Life depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients."[37]

The objectives of the CBD as stipulated in Article 1 include the conservation of biological diversity and the sustainable use of its components and the fair and equitable sharing of the use of its genetic resources. It is the two first-mentioned objectives that are transformed into legal obligations that will be addressed here. As previously stated, the definition of biodiversity includes the diversity between and among genes, species and ecosystems. The objectives which are translated into legally binding obligations will be discussed in section 3.2.

The introduction of scientific concepts such as biodiversity and ecosystem into law is challenging. The ecosystem concept has been promoted through its status as a scientific ethical imperative.[38] The concept has yet to be translated in to a precise legal normative language,[39] and involves variation in scale, both in geography and time.[40] Biodiversity has been described as a "construct in process".[41] The situation is made no less complicated by differences within the scientific community as to the meaning of these concepts.[42]

Therefore it was ambitious to develop legal rules within such a wide area.[43] The reservations included in several of the provisions, such as "… as far as possible and as appropriate … " must be read in this context. Some have argued this weakens their legal character.[44] Others maintain that these still include legal obligations of performance, but provide states with necessary flexibility, as it is problematic and perhaps undesirable to establish uniform obligations,[45] since the prevailing ecological situation may vary, and states have different responsibilities depending on their capabilities. The CBD has been described by some as a framework conven-

37. UNGA Resolution 37/7 World Charter for Nature, Annex.
38. Dan Tarlock, "Ecosystems". In: D. Bodansky, J. Brunné and E. Hey, (eds.). *The Oxford Handbook of International Environmental Law*. Oxford: Oxford University Press, pp. 574–596 at p. 575.
39. Tarlock *supra* note 38, p. 576.
40. *Supra* note 38, pp. 580–581.
41. *Supra* note 38, p. 581.
42. *Supra* note 38, p. 579; Désirée M. McGraw, "The CBD – Key Characteristics and Implications for Implementation", *Review of European Community & International Environmental Law*, vol. 11, 2002, pp. 17–28 at p. 24.
43. Tinker, *supra* note 35, p. 202; Chris Wold, "The Futility, Utility, and Future of the Biodiversity Convention", *Colorado Journal of International Environmental* Law, vol. 9(1), 1998, pp. 1–42 at pp. 10–14.
44. Birnie, Boyle and Redgwell, *supra* note 36, p. 617.
45. Wold, *supra* note 43, p. 15; Ingvild U. Jakobsen, *Marine Protected Areas in International Law: A Norwegian Perspective*, PhD thesis, Faculty of Law, University of Tromsø, 2009, p. 157.

tion; developing policies to be implemented nationally and to supplement existing legal obligations.[46] It has been characterized as process-oriented and the focus should be on its implementation through agreements, decisions of the Conference of Parties and state practice, rather than the legal text in isolation.[47] The Fish Stocks Agreement is one example of how these obligations are to be implemented within international fisheries law, as presented here in section 3.3. Consequently, the conservation and sustainable use of biodiversity will be regulated both by hard law and soft law. The concept of ecosystem approach is developed through the Conference of Parties under the CBD and will be discussed in section 3.4.

The definition of biodiversity indicates that the obligations under the CBD also are applicable to marine ecosystems. The Agenda 21 adopted at the same time as the CBD includes recognition that:

> The marine environment – including the oceans and all seas and adjacent coastal areas – forms an integrated whole that is an essential component of the global life-support system and a positive asset that presents opportunities for sustainable development […] This requires new approaches to marine and coastal area management and development, at the national, subregional, regional and global levels, approaches that are integrated in content and are precautionary and anticipatory in ambit.[48]

As will be discussed, the integrated approaches are consistent with the obligations under the CBD. Under Agenda 21 the integrated approaches are to be applied within the framework of the LOS Convention. CBD overlaps thematically with other conventions, but also includes legal implications in areas not regulated through convention.[49] Where conventions overlap their relationship has to be clarified.[50] The obligations under CBD will supplement the obligations of its States Parties under the LOS Convention. Under Article 22 (2) of the CBD it is stipulated that its provisions are to be applied consistently with the rights and obligations of states under the law of the sea. Implementing the obligations under CBD will probably not conflict with the obligations of conservation and environmental protection

46. McGraw, *supra* note 42, pp.18–20; Wold *supra* note 43, p. 23.
47. Birnie, Boyle and Redgwell, *supra* note 36, p. 615 and p. 617.
48. Report of the United Nations Conference on Environment and Development (Rio de Janeiro, 3–14 June 1992), A/CONF.151/26 (Vol. II) 13 August 1992, Chapter 17.1, available on www.un.org/esa/dsd/agenda21/ (April 2010).
49. McGraw, *supra* note 42, p. 19; Wold, *supra* note 43, p. 23.
50. Wold, *supra* note 43, p. 13; McGraw, *supra* note 42, p. 22.

under the LOS Convention.[51] Conflicts may arise where the implementation infringes on rights of other states such as the freedom of navigation.[52] On the other hand, when such activities may cause "serious threat to biodiversity" the exercise of such rights may be restricted by CBD Article 22 (1).[53]

First the main obligations on conservation and sustainable use of biodiversity (section 3.2) will be discussed before the implementation of these norms within international fisheries law (section 3.3) and the concept of ecosystem approach (section 3.4) are addressed. The ecosystem approach it is argued is a strategy for the implementation of the CBD.

3.2 The obligations of conservation and sustainable use of marine biodiversity

The CBD is according to Article 4 (a) applicable to areas under national jurisdiction, which include the internal waters, territorial sea as well as the 200 mile exclusive economic zone (EEZ) and the continental shelf.[54] In areas beyond national jurisdiction (high seas) the provisions are applicable to the activities and processes taking place under the jurisdiction or control of the individual state, CBD Article 4 (b). The CBD is not applicable to the components of biological diversity or areas of the high seas since states are not competent to sovereignty here.[55] 'Activities' and 'processes' are not defined, but may include human activities of shipping, fishing, industry and agriculture which all may affect biological diversity. As the CBD under Article 4 (b) is applicable to activities and processes irrespective of where their effects occur, its obligations are applicable to the flag state when vessels are fishing or navigating on the high seas or in the maritime zones of other states.

51. Rüdiger Wolfrum and Nele Matz, "The Interplay of the United Nations Convention on the Law of the Sea and the Convention on Biological Diversity", *Max Planck Yearbook of United Nations Law*, vol. 4, 2000, pp. 423–445–480 at p. 463.
52. Alan Boyle, "Relationship between International Environmental Law and other Branches of International Law", in D. Bodansky, J. Brunnée and E. Hey (eds.), *The Oxford Handbook of International Environmental Law*, Oxford University Press: Oxford, 2007, pp. 125–146, at pp. 138–140; Julian Roberts, *Marine Environment Protection and Biodiversity Conservation. The Application and Future Development of the IMO's Particularly Sensitive Sea Area Concepts*, Springer: Berlin, 2007, p. 33.
53. Boyle, *supra* note 52; Wolfrum and Matz, *supra* note 51, p. 463.
54. Wolfrum and Matz, *supra* note 51, p. 462.
55. A.C. de Fontaubert, D.R. Downes and T.S. Agardy, "Biodiversity in the Seas: Implementing the Convention on Biological Diversity in Marine and Coastal Habitats", *Georgetown International Environmental Law Review*, vol. 10 (1998) pp. 753–854 at pp. 756–757. It is also stipulated in the LOS Convention Article 89.

The distinction made between areas within and beyond national jurisdiction reflects according to Tanaka[56] that the CBD "… relies in essence on the traditional zonal management approach … " as stipulated under the law of the sea. It is problematic because the obligations in respect of the biodiversity beyond national jurisdiction are not clear. Some states have proposed a new implementation agreement on biodiversity in areas beyond national jurisdiction to ensure more comprehensive protection, such as establishing marine protected areas, which is problematic to establish under the prevailing regimes.[57] The CBD does not include detailed provisions to regulate the transboundary character of biodiversity and ecosystems. In these situations states are under an obligation to co-operate as stipulated in Article 5. They are directed to co-operate directly or through appropriate international organizations with respect to the high seas or areas of mutual interest on conservation and sustainable use of diversity. Two or more coastal states sharing marine ecosystems will have "mutual interests". The organizations referred to could include regional fisheries management organizations and regional seas conventions as well as the IMO.

The translation of the objectives of conservation and sustainable use of biodiversity into obligations is most evident in Article 8 on *in-situ* conservation, and Article 10 on sustainable use. These two concepts are defined in Article 2, providing them with clearer content: *In situ* conservation is defined as "the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings …" Ecosystem is "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit." Thus, conservation of biodiversity means more than maintaining populations of species, but also the interaction between species and between species and the non-living environment. Sustainable use is the "use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity …" There is no clear distinction between conservation and sustainable use as there is a reference to sustainable use in Article 8 and conservation of biodiversity in Article 10. Although the two objectives and obligations have been clarified through concepts

56. Yoshifumi Tanaka, *A Dual Approach to Ocean Governance: The Cases of Zonal and Integrated Management in International Law of the Sea*, Ashgate: Farnham, 2008, pp. 146–147.

57. Report of the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction, (A/61/65) paragraph 25; Erik J. Molenaar, "Managing Biodiversity in Areas Beyond National Jurisdiction", *International Journal of Marine and Coastal Law*, 22 (1), 2007, pp. 89–124 at p. 95; J. Mossop, "Protecting Marine Biodiversity on the Continental Shelf Beyond 200 Nautical Miles", *Ocean Development & International Law*, 38 (3), 2007, pp. 283–304.

of 'ecosystem', 'species' and 'habitat', these concepts are not easily translated into legal operational norms. A closer study of the provisions of the CBD may provide further assistance through the following structure:

- Identification and monitoring and impact assessment, Articles 7 and 14;
- Measures, Articles 8-10; and
- Strategies, plans and programs, Article 6.

The sum of these obligations is a requirement for a comprehensive approach to the protection of the marine environment.

Coastal states are required to identify relevant ecosystems and their elements, and monitor their status in areas under their jurisdiction, CBD Article 7 (a) and (b). This includes undisturbed ecosystems, ecosystems with endangered species, as well as representative ecosystems. They are also to identify species; especially endangered species, key species in the ecosystem, and valuable species. All states are to identify and monitor processes and activities with potential adverse effects on the conservation and sustainable use of the biodiversity, Article 7 (c). This obligation has to be read in context of the jurisdictional application of the CBD as stipulated in Article 4 (b), and is linked to the effects of activities and processes under their jurisdiction. As mentioned above, this includes all activities having an effect on biodiversity. In the identification and monitoring process, the effects of activities and processes under the jurisdiction of one state cannot be viewed in isolation but have to be considered together with the effects of natural variations and effects of human activities under the jurisdiction of other states. Furthermore, the obligation also presupposes identification of ecosystems and species. In this sense humans are part of the ecosystem. This may present a difficulty as the effects of activities and processes may manifest far from their state of origin.

These procedural obligations help in identifying and delimitating the species and ecosystems – objects of conservation and sustainable use – an important first step in the process of compliance with the substantive obligations stipulated in Articles 8 and 10. The requirement of monitoring confirms that the obligations are not fixed, but have to be adapted to change. States are required to do more than general assessments of the state of species and ecosystems. They are also to undertake impact assessment of projects as well of plans and strategies with potential adverse effects on biodiversity, for CBD Article 14 (a) and (b). These obligations indicate that the substantive obligations in contrast to the law of the sea focus on the effects more than the sources. Such obligations provide for more holistic approaches to environmental protection, where cumulative effects may not be ignored.

The measures stipulated in CBD Article 8 and Article 10 include both traditional nature conservation and newer types of measures. The traditional measures involve both the protection of species and of protected areas, which will promote conservation of representative ecosystems or habitats, and habitats of endangered species, Article 8 (a) and (b), (f) and (k). States are also required to regulate activities around the protected areas to prevent harmful effects, Article 8 (e). But the obligation is wider and includes measures aimed at managing key species in ecosystems, promoting the protection of ecosystems and habitats, as well as viable populations of species, Article 8 (c) and (d). The obligation also includes prevention of the introduction of alien species, and regulation of the release of modified species, Article 8 (g) and (h). States are also to take measures to regulate and manage processes and activities identified as having a significant adverse effect on biodiversity, Article 8 (l). This obligation is rather broad and vague; both in respect of impacts to be mitigated and the measures to be taken. It may include effects of pollution from vessels and land based activities. But the measures to be taken clearly confirm that regulating such activities and processes is important for conservation of biodiversity and that they are to be an integrated part of biodiversity conservation. A key question is whether the obligation to regulate these activities adds to the concrete obligations under other environmental agreements particularly aimed at these obligations. It may be more fruitful to view the obligation under Article 8 (l) as supplementing existing obligations. As part of the obligation of sustainable use, states are required under Article 10 (b) to adopt preventive measures to minimize the negative effects of the use on biodiversity. This is a recognition that living marine resources may be exploited (genetic resources as well as populations of species), but states are required to prevent over-exploitation of the target species, as well as adverse effects on other species or habitats, all part of the marine biodiversity.

States are obligated to take concrete measures to conserve biodiversity and to ensure that its elements are used sustainably. But they are also required to integrate these two objectives into their national decision-making and in sectoral and cross-sectoral plans, Articles 6 and 10 (a). These plans, strategies or programs shall include the different relevant measures under Articles 8 and 10. Although states have wide discretion as to the format and status of these instruments, they are required to take a holistic and systematic and not random approach to environmen-

tal protection. They have discretion to integrate these objectives into other types of plans, either sectoral or cross-sectoral, CBD Article 6 (b). This may be viewed as an application of the principle of integration of environmental consideration into economic development, and vice versa.[58] Conservation of biodiversity is not only a matter for the environmental protection agencies or fisheries management directorates, but for the maritime directorates and petroleum directorates as well. States may continue the traditional sectoral approach to environmental protection, natural resource management and land use, but are required to apply a broader approach at the different stages of decision-making. It is important to note that the CBD does not prescribe an obligation for states to develop trans-national plans, programs or policies for the conservation and sustainable use of biodiversity. Such documents will have to be developed on the basis of the obligation of co-operation under Article 5 of CBD.

3.3 Protection of marine biodiversity in international fisheries law

International fisheries law is perhaps the subject area at a global level where most initiatives are taken to address the protection of marine biodiversity. The Fish Stocks Agreement and the FAO Code of Conduct for Responsible Fisheries[59] are prime examples to be presented here, supplementing the LOS Convention.[60] IMO has also adopted global instruments to protect marine biodiversity from the effects of shipping activities.[61] These include the Ballast Water Convention[62] to prevent the transfer of harmful aquatic organisms and pathogens by controlling ballast

58. Report of the United Nations Conference on Environment and Development (Rio de Janeiro, 3–14 June 1992) Annex I Rio Declaration on Environment and Development, **A/CONF.151/26 (Vol. I),** Principle 4; Philippe Sands, *Principles of International Environmental Law.*2nd *Edition*, Cambridge University Press: Cambridge, 2003, pp. 263–266.
59. Code of Conduct for Responsible Fisheries, adopted at the Twenty-seventh Session of the FAO Conference, 31 October 1995, available on www.fao.org/docrep/005/v9878e/v9878e00.HTM (April 2010).
60. Wolfrum and Matz, *supra* note 51, p. 453. Boyle, *supra* note 52, p. 140; Alan Boyle, "Further Development of the Law of the Sea: Mechanisms for Change", *International and Comparative Law* Quarterly, vol. 54, 2005, pp. 563–584, at pp. 569–570.
61. Roberts, *supra* note 52, pp. 107–108.
62. International Convention for the Control and Management of Ships' Ballast Water and Sediments, adopted 13 February 2004, not in force, International Conference on Ballast Water Management for Ships, Annex I, BWM/CONF/36.

water of ships, and the set of rules for the establishment of particularly sensitive sea areas.[63]

All the Arctic coastal states are States Parties to the Fish Stock Agreement.[64] It is important to note that this agreement is primarily applicable to harvesting on the high seas areas and especially to so-called straddling and highly migratory fish stocks, FSA Article 3. The general principles of conservation and management are applicable to areas under national jurisdiction as well. However, the non-binding Code of Conduct is applicable to all marine harvesting in all maritime zones, Article 1.

The protection of marine biological diversity is one of the general principles under the Fish Stocks Agreement to fulfill the objective of long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks.[65] The Code of Conduct includes a similar principle, as states are to promote the maintenance of the quality, diversity and availability of fisheries resources.[66] The concept of biodiversity is not defined, but the principle is elaborated through other general principles, which include the precautionary approach. States are required to adopt the precautionary approach in order to "… protect the living marine resources and to preserve the marine environment".[67] The requirement of states to coordinate measures in respect of transboundary fish stocks between areas under national jurisdiction and beyond will also promote protection of marine biodiversity.[68] The same structure as above is chosen to present the relevant obligations that specify the biodiversity protection principle:

- Identification and monitoring: States are not only to assess the effects of fishing on target stocks.[69] The assessment to be undertaken will and shall include effects of other human activities and environmental factors on target species, as well as on other species of the ecosystem and their environment. The last-mentioned include the non-living elements of the ecosystem. The obligation of assessment to be undertaken regularly presupposes the collection of data from

63. IMO Resolution A.982 (24), 1 December 2005, Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas.
64. An overview of the status of the Fish Stocks Agreement is available on www.un.org/Depts/los/convention_agreements/convention_overview_fish_stocks.htm.
65. Fish Stocks Agreement, Article 5 (g).
66. Code of Conduct, Article 6.2.
67. Fish Stocks Agreement Article 6 (1) and Code of Conduct Article 6.5.
68. Wolfrum and Matz, *supra* note 51, p. 453 with reference to Article 7 of the Fish Stocks Agreement and Article 7.3 of the Code of Conduct.
69. Fish Stocks Agreement Article 5 (d) and Article 6 (3) (d) and Code of Conduct Articles 6 (4) and 7.2.3.

fisheries and conduct of scientific research to identify the relevant ecosystems and species, as well as of the human and non-human activities affecting marine biodiversity. States are required to have updated knowledge on the total pressure on marine ecosystem subjected to fishing.

- Measures to protect marine biodiversity: As overexploitation is identified as a major source of biodiversity loss, the obligation of ensuring long-term sustainability of target fish stocks is vitally important.[70] States are also required to subject other species of the ecosystem to enhanced monitoring where there is concern for their status and where necessary to take measures directed at conserving these species.[71] Protected areas are introduced as a measure to protect vulnerable habitats, including on the high seas. It is important to note that such area is protected against a particular activity: harvesting of living marine resources.
- Management plans and strategies: The obligation to apply the precautionary approach includes a requirement of establishing stock-specific reference points and measures to be taken when they are exceeded.[72] States are to set objectives for the conservation and management of fish stocks which will direct the regulation of fisheries. They are required to develop plans and strategies for the conservation and management of living resources in a broad sense.

3.4 The Ecosystem Approach: operationalizing the obligations

The ecosystem approach concept has been introduced through different types of fora and instruments. The Conference of Parties under the CBD has established the ecosystem approach as the "… primary framework for action taken under the Convention."[73] The FAO has adopted guidelines on the ecosystem approach to fisheries management to implement the Code of Conduct of Responsible Fisheries.[74] The UN General Assembly has endorsed the concept in its Law of the Sea reso-

70. Fish Stocks Agreement Articles 6 (5) and 5 (a) and Code of Conduct Article 7.1.1.
71. Fish Stocks Agreement Article 5 (e) and Code of Conduct Article 6.2.
72. Fish Stocks Agreement Article 6 (3) (b) and (4) and Code of Conduct Article 7.5.3.
73. COP CBD Decision II/8, *Preliminary Consideration of Components of Biological Diversity particularly under threat and action which could be taken under the Convention*, available on www.cbd.int/decision/cop/?id=7081 (April 2010).
74. Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem, October 2001, available on www.fao.org/docrep/meeting/004/Y2211e.htm (April 2010); FAO Fisheries Department. "The ecosystem approach to fisheries", *FAO Technical Guidelines for Responsible Fisheries*. No. 4, Suppl. 2. Rome, FAO, 2003.

lutions[75] and Sustainable Fisheries resolutions.[76] At the 2000 World Summit on Sustainable Development in Johannesburg, states were encouraged to apply the ecosystem approach by 2010.[77]

However, there seems to be some confusion about its description, with potential consequences for its content and status.[78] Several descriptions of the concept are used, including *an* ecosystem management, ecosystem-based management, and ecosystem considerations.[79] According to Trouwborst[80] this demonstrates the concept is still controversial. Tanaka[81] points out there is no universal definition of the ecosystem approach itself due to its lack of specificity. This may mean the concept is still under development. The term 'eco-system management' is an older concept, originating in the USA and Canada.[82] There is also confusion as to the legal status of the concept. Some argue with reference to provisions of the LOS Convention and the Fish Stocks Agreement that they reflect the ecosystem

75. A/RES/61/222 *Oceans and the Law of the Sea*, paragraph 119 where it is noted that "… ecosystem approaches to ocean management should be focused on managing human activities in order to maintain and, where needed, restore ecosystem health to sustain goods and environmental services, provide social and economic benefits for food security, sustain livelihoods in support of international development goals, including those contained in the Millennium Declaration, and conserve marine biodiversity".
76. A/RES/62/177 *Sustainable fisheries, including through the 1995 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, and related instruments*, paragraphs 93 and 97.
77. Plan of Implementation of the World Summit on Sustainable Development, paragraph 30 (d), available on www.un.org/jsummit/ (April 2010).
78. Tanaka, *supra* note 56, p. 79; Arie Trouwborst, "The Precautionary Principle and the Ecosystem Approach in International Law: Differences, Similarities and Linkages", *Review of European Community & International Environment*, vol. 18 (1), 2009, pp. 26–37, at pp. 27–31; Hanling Wang, "Ecosystem Management and Its Application to Large Marine Ecosystems: Science, Law, and Politics", *Ocean Development & International Law*, vol. 35, 2004, pp. 41–74, at p. 43.
79. Trouwborst, *supra* note 78, p. 27–28; Wang, *supra* note 78, p. 43.
80. Trouwborst, *supra* note 78, p. 28.
81. Tanaka, *supra* note 56, p. 79 with a reference in his footnote 65 to *Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting*, A/61/156, paragraph 6.
82. Volkmar Hartje, Axel Klaphake & Rainer Schliep, "The International Debate on the Ecosystem Approach Critical Review International Actors Obstacles and Challenges", *Working Paper on Management in Environmental Planning* 06/2003, BfN – Skripten 80, 2003, p. 8, available on www.cbd.int/doc/meetings/esa/ecosys-01/information/ecosys-01-inf-03-en.pdf (April 2010).

approach.[83] Others are more reluctant to ascribe the concept a legal character.[84] The ecosystem approach has been criticized also on its substantial elements:[85] There is inadequate scientific information on ecosystems to apply the approach, as they are transboundary in character and will meet jurisdictional obstacles, and the concept complicates management unnecessarily. Such criticisms apply to the obligations on conservation and sustainable use of biodiversity in general.

Therefore it is characteristic that the CBD describes the ecosystem approach as a "… a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way …"[86] The concept gives an appropriate description of how the states shall implement their obligations under the CBD.[87] Similarly the FAO has described the ecosystem approach to fisheries management as a "… way to implement many of the provisions of the Code [of Conduct on Responsible Fisheries] to achieve sustainable development".[88] It may add to the specification of obligations of states under the CBD and other relevant conventions. The following gives a brief presentation of the ecosystem approach as developed through the CBD and the FAO.

In its description of the ecosystem approach, CBD stresses that the approach is based on the structure, processes, functions and interaction among organisms and the environment consistent with the definition of ecosystem.[89] Man is part of the ecosystem. The ecosystem approach provides a methodical framework to support decision-making.[90] What adds to the confusion on the content of the concept is the recognition that the ecosystem approach may be implemented in different ways. One example of sectoral implementation is the ecosystem approach to fisheries management developed by the FAO. But it reflects the flexibility provided by Article 6 of the CBD presented above. The 12 (Malawi) principles provide

83. Wang, *supra* note 78, pp. 49–50; Wolfrum and Metz, *supra* note 51, p. 453.
84. Knut Kroepelien, "The Norwegian Barents Sea Management Plan and the EC Marine Strategy Directive: Some Political and Legal Challenges with an Ecosystem-based Approach to the Protection of the European Marine Environment", *Review of European Community & International Environment* 16 (1), 2007, pp. 24–35 at p. 26; Tanaka, *supra* note 56, p. 79.
85. Wang, *supra* note 78, pp. 56–58 with references.
86. CBD CoP Decision V/6 Ecosystem approach, Annex. A, available on www.cbd.int/decision/cop/?id=7148 (April 2010).
87. Conference of the Parties to the Convention on Biological Diversity: Report of the Workshop on the Ecosystem Approach (UNEP/CBD/COP/4/Inf.9, 20 March 1998), paragraph 9.
88. FAO Fisheries Department, *supra* note 74, p. 5.
89. *Supra* note 86.
90. CBD CoP, Decision VII/11 Ecosystem approach, Annex I, A.4.

guidelines.[91] The principles are not only about the conservation of species and habitats but involve social and economic considerations as well.[92] Principles on social and economic interests include the principles that management objectives are to reflect societal choices, and that ecosystems should be managed within an economic context. Furthermore, management must recognize that change is inevitable, encouraging adaptive management. The principle on conservation includes the considerations of activities on other ecosystems, the conservation of ecosystem structure and functioning, and ecosystem management must be within the limits of their functioning. Another type of principle is that the ecosystem approach should involve all relevant sectors of society and scientific disciplines. This could be achieved by integrating the approach either within separate sectors or across sectors.

The ecosystem approach to fisheries management is an example of sectoral integration of the approach. The guidelines adopted by the FAO include principles on which the ecosystem approach is based, and how they are to be translated into action at different levels.[93] The principles include the prevention of overfishing, minimizing effects on the ecosystem, taking into account interaction between species, improving human well-being, and maintaining ecosystem integrity.[94] Both societal and environmental interests are included. The principles have a clearer link to the legal obligations than the Malawi principles. The operationalization of the principles includes development of management plans involving political objectives to balance the different interests, quantitative objectives and indicators, as well as decision rules on the use of measures, all coupled with monitoring and evaluation.[95]

There is a connection between the ecosystem approach as a general applicable concept and the concept of 'integrated marine and coastal area management' also developed through the CBD. The implementation of the CBD in respect of the marine and coastal environment started early under the so-called Jakarta mandate.[96] A programme of work has been adopted to guide states in the implementation of the CBD on national as well as regional and global levels where the ecosystem

91. These have been further detailed by implementation guidelines in Decision V/11, see supra note 89.
92. Supra note 86.
93. FAO Fisheries Department, *supra* note 74, pp. 14–17.
94. FAO Fisheries Department, *supra* note 74, p. 14 and Annex 2, p. 83.
95. FAO Fisheries Department, *supra* note 74, pp. 43 ff.
96. Maas M. Goote, "The Convention on Biodiversity: The Jakarta Mandate on Coastal and Marine Biodiversity", *The International Journal of Marine and Coastal Law*, vol.12 (3), 1997, pp. 377–395 at pp. 377–389.

approach and the precautionary approach are basic principles.[97] One of the elements of the programme is integrated marine and coastal area management.[98] States are encouraged to "… promote integrated multidisciplinary and multisectoral coastal and ocean management at the national level …", a cross-sectoral application of the ecosystem approach in line with the recognition of Agenda 21 referred to above.

The ecosystem approach as elaborated by the CBD and FAO adds to the obligations of states under the CBD and international fisheries convention: The approach stipulates a holistic approach to the management of human activities, based on available knowledge on the components, structure and dynamics of ecosystems, and that it is legitimate to promote societal and economic interests in a way that does not threaten the integrity of ecosystems.[99]

4. Conservation and sustainable use of Arctic marine biodiversity

4.1 General

This section presents and assesses how the above-mentioned obligations are and may be implemented within the marine Arctic. As may be remembered, the obligations as developed through the ecosystem approach are primarily to be applied at a national level. As ecosystems and threats to their function, structure and productivity are transboundary issues, regional or even global approaches to their management are required. Therefore regional co-operation on possible future activities within the Arctic relevant for the protection of marine biodiversity will be addressed. In section 4.2 some of the existing agreements will be presented, with the view to assessing gaps and weaknesses. The Arctic Council was established in 1996 with the objective of promoting co-operation between the Arctic states and addressing common Arctic issues such as environmental protection.[100] In section 4.3 the work through the Arctic Council on marine biodiversity will be examined. Although the Arctic Council is not a regulatory body, its work may be viewed as fulfilling the obligations of the member states under the CBD. On this

97. CoP CBD Decision VII/5: Marine and coastal biological diversity. Review of the programme of work on marine and coastal biodiversity, Annex I Elaborated Programme of Work on Marine and Costal Biological Diversity, available on www.cbd.int/decision/cop/?id=7742 (April 2010).
98. CoP CBD Decision VII/5, *supra* note 96, III. Programme Element.
99. Trouwborst, *supra* note 78, p. 28.
100. "Declaration on the Establishment of the Arctic Council" (The Ottawa Declaration), available on http://arctic-council.org/section/founding_documents (April 2010).

basis, discussion of options for the future governance of marine Arctic biodiversity is undertaken in section 4.4.

At the outset it is important to note that the USA is neither a State Party to the LOS Convention nor the CBD, having possible implications for implementation in the Arctic.

4.2 Existing legal regimes on the conservation and sustainable use of marine Arctic biodiversity

The relevant legal regimes are to a large degree sectoral, aimed at regulating effects of specific human activities such as shipping, petroleum activities and harvest of living marine resources, which are likely to expand in the future Arctic. The 1973 Polar Bear Agreement is one of the few treaties exclusively regulating Arctic biodiversity.[101] International shipping is regulated through the globally applicable SOLAS and MARPOL conventions[102] on maritime safety and environmental protection also relevant in the Arctic, adopted through the IMO. IMO has adopted particular guidelines for shipping in ice-covered areas of the Arctic.[103] High seas fisheries and pollution from land-based and seabed activities are regulated through regional conventions.[104] The coastal states are also involved in bilateral co-operation on management of shared living marine resources, which will not be addressed here.[105]

In the following, *NEAFC* and *OSPAR* will be examined in more detail, as these two bodies have introduced biodiversity and are involved in regulating activities in areas both within and beyond national jurisdiction. The presentation is thus not meant to be exhaustive. The *OSPAR* Convention includes areas under national jurisdiction and beyond in parts of the Arctic Ocean, Article 2 and Article 1 (1)

101. Agreement on the conservation of polar bears, adopted 15 November 1973, in force 26 May 1976, *International Legal Materials*, vol. 13, pp. 13.
102. International Convention for the Safety of Life at Sea (SOLAS) with protocols, 1184 UN *Treaty Series*, vol. 1184, p. 277; International Convention for the Prevention of Pollution from Ships (MARPOL), United Nations *Treaty Series*, vol. 1340, pp. 61.
103. Guidelines for Ships Operating in Arctic Ice-Covered Waters, MSC/Circ.1056/MEOC/Circ.399, December 2002, available on www.imo.org/includes/blastDataOnly.asp/data_id%3D6629/1056-MEPC-Circ399.pdf (April 2010).
104. The Convention on future multilateral cooperation in North-East Atlantic Fisheries, adopted London 18 November 1980 in force 22 July 1982, United Nations *Treaty Series*, vol. 1285, pp. 130; *supra* note 4 for the reference to the Convention on the Protection of the Marine Environment of the North-East Atlantic (hereafter also the OSPAR Convention).
105. In Olav Schram Stokke (ed.), *Governing High Seas Fisheries*, Oxford University Press: Oxford, 2001, an overview is provided through chapters 5–9.

(a). As the Russian Federation is not a Contracting Party to the convention, the area of application does not include all of the Euro-Arctic. In order to fulfill the objective to "… prevent and eliminate marine pollution and to achieve sustainable management of the maritime area …" the OSPAR Convention includes pollution from different sources: land-based sources, offshore sources and pollution from dumping and other sources, Articles 3-7. The OSPAR Commission set up under the convention is competent to adopt both binding and non-binding decisions to implement the obligations, Articles 10 and 13.

In 1998 the OSPAR Convention had a new annex V added on protection and conservation of the ecosystems and biological diversity. The annex may be viewed as a means of implementing the obligations of the contracting parties under the CBD, Annex V, Articles 1 and 2. The OSPAR Commission is competent to adopt additional measures (to those regulating discharges of pollution) to protect and if necessary restore ecosystems, Article 3 (1) (a) Annex V. These measures may include protection of areas or habitats or bans on activities such as sand gravel extraction. The programmes and measures to be adopted under Annex V shall "… aim for an integrated ecosystem approach, Article 3 (1) (b). The adoption of these measures must be seen in context with other measures available under the OSPAR Convention. According to Molenaar and Dotinga, the OSPAR provides for a "comprehensive legal framework for the implementation of part XII of UNCLOS and CBD […] on a regional level."[106] The OSPAR Commission is not competent to regulate fisheries or shipping navigation, Annex V Article 4. It is required where action is necessary to co-operate with the competent authority or international body. The OSPAR Commission has established co-operation with NEAFC, IMO and ICES.[107] OSPAR has so far refrained from adopting binding decisions, focusing on assessments and listing of threatened species and habitats, developing of environmental quality objectives, and assessment and monitoring of different human activities of under its marine biodiversity strategy.[108]

The North-East Atlantic Fisheries Commission (NEAFC) is competent to regulate fishing on the high seas in the north-east Atlantic but not the Arctic Ocean.[109] Its constituent treaty has been amended to incorporate the new environmental

106. Harm Dotinga and Erik Jaap Molenaar, *The Mid-Atlantic Ridge: A Case Study on the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction*, IUCN, Gland Switzerland, 2008, p. 8.

107. Dotinga and Molenaar, *supra* note 106, p. 18.

108. 2003 Strategies of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic, available on www.ospar.org/html_documents/ospar/html/Revised_OSPAR_Strategies_2003.pdf#nameddest=biodiversity (April 2010).

109. NEAFC Convention, *supra* note 104, Article 1.

principles and other legal developments of recent years:[110] In regulating living marine resources NEAFC is to apply the precautionary approach, to take due account of the fisheries on non-target species and the ecosystem to minimize adverse effects, and take due account of the protection of marine biodiversity.[111] According to a recent review of NEAFC, there is some concern about the effects of deep-sea fisheries on habitats.[112] NEAFC has introduced particular procedures for bottom fishing and adopted temporary bans on bottom-trawling in some identified areas.[113] NEAFC has also introduced a ban on discards.[114] The International Council for the Exploration of the Seas (ICES) has played an important role in the implementation of environmental principles into north Atlantic fisheries management through its advice to national authorities as well as NEAFC.[115] The precautionary approach was introduced in 1998 and the ecosystem approach in 2005.[116] The advice now also includes consideration of ecosystem aspects such as habitat and biota impacts of dragged gear, incidental by-catches of non-commercial species, and food chain effects of fishing.

In addition to the need for more and binding regulation of Arctic shipping (including for contingency planning and preparedness as identified in the Ilulissat Declaration), there is concern about the lack of legal regimes to regulate the high seas fisheries, off-shore petroleum activities, and other activities traditionally regulated under regional seas regimes.[117] Neither NEAFC nor OSPAR is applicable to major parts of the marine Arctic.

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110. Report of 24th Annual Meeting of the North-East Atlantic Fisheries Commission 14–18 November 2005, item 12. At the same meeting NEAFC (item 13) adopted a declaration where the contracting parties committed to interpret and apply the convention temporarily consistent with the new principles until the amendments enters into force. The texts of the amendments and the declaration are available at http://www.neafc.org/basictexts (April 2010).
111. New NEAFC Convention, *supra* note 110, Article 4.
112. Report of Performance Review Panel (Report of the North East Atlantic Fisheries Commission, 6 November 2006, p. 34; http://www.neafc.org/news/docs/performance-review-final-edited.pdf (3 June 2008).
113. NEAFC Recommendations VIII: 2009 and Recommendations IV and VIII: 2010 available at http://www.neafc.org/current-measures-list (April 2010).
114. NEAFC Recommendation XVI: 2010.
115. O.S. Stokke, and C. Coffey, "Precaution, ICES and the common fisheries policy: a study of regime interplay", *Marine Policy*, vol. 28, 2004, pp. 117–126 at pp. 123–124.
116. ICES. *Report of the ICES Advisory Committee, 2008. ICES Advice, 2008. Book 1*, pp. 5–11, available on www.ices.dk/products/icesadvice/2008/ICES%20ADVICE%202008 %20Book%201.pdf (April 2010).
117. Koivurova and Molenaar, *supra* note 6, pp. 39–49.

4.3 The Arctic Council and marine biodiversity

The Arctic states have co-operated since the early 1990s *particularly* on environmental issues; organized through the Arctic Council.[118] The Arctic Council set up in 1996 as a 'high level forum' has advisory functions and is described appropriately as "… consensus-based and project-driven and not an operational body."[119] Several working groups were established under the Arctic Council tasked with environmental issues; including Protection of Arctic Marine Environment (PAME), the Arctic Assessment Programme (AMAP) and Conservation of Arctic Flora and Fauna (CAFF).[120] Important tasks for these working groups are to identify, assess and monitor the state of and the risks to the Arctic environment through effects of different types of human activities (pollution, climate change and shipping).[121] Their work has led to adoption of several guidelines, such as the International Code for Ships Operating in Polar Waters through IMO, developed together with IMO and Arctic Offshore Oil & Gas Guidelines.[122]

PAME was responsible for developing the Arctic Marine Strategy (AMSP)[123] endorsed by the 2004 Arctic Council Ministerial Meeting.[124] AMSP, described as holding the "… greatest promise …" of the Arctic Council, is comprised of all Arctic marine areas, including coastal areas and key activities affecting ecosystems.[125] The strategy is interestingly described as an opportunity to implement legal and political obligations such as the CBD.[126] The rationale for its development includes climate change and increasing economic activities leading to increased environmental risks.[127] The vision of the strategy is a healthy and productive Arctic ocean, to be achieved by the conservation of Arctic marine biodiversity and ecosystem functions, which is one of the goals of the strategy.[128] An ecosystem approach is included among the principles and approaches on which the AMSP is

118. Timo Koivurova, and David VanderZwaag, "The Arctic Council at 10 Years: Retrospect and Prospects", *University of British Columbia Law Review*, vol. 40 (1), 2007, pp. 121–194, at pp. 123–128.
119. Koivurova and Molenaar, *supra* note 6, p. 12.
120. An overview of the working groups is available on http://arctic-council.org/section/working_groups (April 2010).
121. Koivurova and VanderZwaag, *supra* note 118, pp. 137–157.
122. Koivurova and VanderZwaag, *supra* note 118, pp. 143–144.
123. Arctic Council: Arctic Marine Strategic Plan, 24 November 2004, available on www.pame.is/images/stories/AMSP_files/AMSP-Nov-2004.pdf (April 2010).
124. Koivurova and VanderZwaag, *supra* note 118, p. 144.
125. Koivurova and VanderZwaag, *supra* note 118, p. 162.
126. AMSP, *supra* note 123, section 1.3, p. 1–2.
127. AMSP, *supra* note 123, section 4.0, pp. 3–4.
128. AMSP, *supra* note 123, sections 2.0 and 3.0, p. 3.

to be based.[129] An ecosystem approach is described as a modern ecosystem-based management concept, requiring the coordination of different human activities to reduce their impact on the environment. It involves consideration of multiple scales, long-term perspectives, and adaptive management. This is reflected in the description of a possible methodology for the application of an ecosystem. The actions to be taken in the implementation of the strategy include important elements of the above-mentioned methodology; improvement of knowledge and understanding of the environment in general, and the identification of large marine ecosystems and indicators for the state of the ecosystem, in order to apply an ecosystem approach.[130]

PAME plays a major role in preparing for an ecosystem approach under the strategy. It has developed maps of the 17 Arctic Large Marine Ecosystems and is in the process of developing indicators as prescribed in the AMSP.[131] PAME was also responsible for the 2009 Arctic Marine Shipping Assessment called for by the AMSP. One of the findings of the assessment is that shipping poses a threat to ecosystems, especially through pollution following accidents, and the introduction of invasive species through ballast water.[132] CAFF is also involved in improving the knowledge and understanding of the marine environment through its Arctic Biodiversity Assessment (ABA) and the Circumpolar Biodiversity Monitoring Program (CBMP).[133]

All action described by the AMSP and the work undertaken by the working groups are consistent with the obligations of states under the CBD to identify and monitor components of biodiversity and activities likely to have significant adverse effects on biodiversity. The description of an ecosystem approach and possible methodology implies a holistic and integrated approach to the management of human activities in the marine Arctic, consistent with the ecosystem approach as developed through the CBD. The highlighting of *an* ecosystem approach and *possible* methodology for its application suggest that the Arctic States are not willing to commit to a particular understanding, thus allowing them a certain flexibility. Parallel to the CBD, the AMSP gives less clear answers as to what institutional framework the conservation of Arctic marine biodiversity is to work within. The strategy suggests that the actions are to be taken at different levels, by member

129. AMSP, *supra* note 123, section 6.0, pp. 8–9.

130. AMSP, *supra* note 123, sections 7.1 and 7.4, pp. 10–11.

131. PAME Progress Report on the Ecosystem Approach to Arctic Marine Assessment and Management 2006–2008, available on www.pame.is/images/stories/FrontPage/PAME-Progress-Report-on-Ecosystem-Approach.pdf (April 2010).

132. Arctic Council, *supra* note 29, pp. 152–153.

133. Louise McRae et al, *supra* note 21.

states, within the working groups of the Arctic Council and through co-operation with other global and regional organizations.[134] The strategy stipulates revision and development of guidelines under the Arctic Council to address some of the environmental concerns, as well as providing recommendations to the IMO on shipping. Furthermore, the Arctic States are to implement and comply with relevant international and regional agreements (7.3.1). As the LOS Convention is to provide the legal framework for the implementation of the AMSP, this may suggest a traditional sectoral approach.[135] However, the Arctic States are also to review the status and adequacy of such agreements. The review, started by PAME, will also include a possible Arctic regional seas agreement.[136] The institutional aspects will be addressed in the next sub-section.

4.4 Options for integrated oceans management

The prospect of increased economic activity in the Arctic, identified gaps in existing legal instruments, and the need for integrated management of human activities as envisaged in the ecosystem approach, call for new approaches to the governance of the marine Arctic. As large parts of the marine Arctic are still considered wilderness, the prospect of applying integrated and holistic approaches could be more realistic than in marine areas where social, economic and other interests are cemented. Several proposals for a legal regime for the protection of the Arctic marine environment have been put forward or discussed. Some of the discussions have been based on or taken inspiration from the prevailing regime of Antarctica.[137] The relevance of this regime for the Arctic will not be addressed here. Koivurova and VanderZwaag[138] have offered a useful systematization of the options by three possible models: the law of the sea approach, regional *sui generis* approach, and a multilateral Arctic Ocean agreement approach.

134. AMSP, *supra* note 123, section 7.0, p.10.
135. AMSP, *supra* note 123, section 7.3.4, p. 11.
136. Arctic Ocean Review Project, available on www.aor.is/ (April 2010).
137. Davor Vidas (ed), *Protecting the Polar Marine Environment: Law and policy for Pollution Prevention*, Cambridge University Press: Cambridge, 2000; Melissa A. Verhaag, "It Is Not Too Late: The Need for a Comprehensive International Treaty to Protect the Arctic Environment", *The Georgetown International Environmental Law Review*, vol. 15, 2002–2003, pp. 555–579, at pp. 571–577; Timo Koivurova, "Alternatives for an Arctic Treaty – Evaluation and a New Proposal", *Review of European Community & International Environmental Law*, vol. 17 (1), 2007, pp.14–26, at p. 17–19; Linda Nowlam, *supra* note 7, pp. 48–54; Rosemary Rayfuse, *supra* note 6; European Parliament resolution of 9 October 2008 on Arctic governance, paragraph 15, available on http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P6-TA-2008-0474 (April 2010).
138. Koivurova and VanderZwaag, *supra* note 118, pp. 186–188

The third model has been put forward with different variations. Rayfuse[139] argues for a comprehensive Arctic High Seas Agreement, regulating activities such as fishing, shipping, scientific research, and promoting an integrated and holistic approach to the environment. Koivurova and Molenaar[140] propose the adoption of a framework convention for the marine Arctic, applicable to areas within and beyond national jurisdiction, in the form of protocols addressing the different human activities. Their proposal would give the Arctic Council a formal role.

The practicality of the three different models was tested by the 2008 Ilulissat Declaration by the five Arctic Coastal States.[141] The coastal states argued that the law of the sea provides states with a "… solid foundation …" for responsible management, and therefore it is not necessary to "… develop a new comprehensive international legal regime …" for the Arctic Ocean. The models where the coastal states claim jurisdiction over the high seas (regional *sui generis*), or where a multilateral Arctic Ocean Agreement is established, are consequently ruled out. The fact that the coastal states met separately is a clear indication they do not want it to have a more formal role in the governance of the marine Arctic. The coastal states seemingly are in favor of a Law of the Sea approach, e.g. by the reference to their roles as stewards and the co-operation through different fora such as the IMO. Those arguing that Arctic states should concentrate on implementing the existing environmental obligations rather than establishing a new regional environmental treaty seem to have the upper hand.[142]

Young[143] recognizes that "… the key to sustainability lies in paying attention to the complex linkages arising from interactions between human activities and biophysical forces." He is skeptical about a comprehensive marine Arctic Treaty for several reasons, referring to the negative attitudes of the Arctic states and questioning the effectiveness of using a legally binding instrument.[144] Wang[145] and Tanaka[146] point to jurisdictional problems arising due to the inconsistency

139. Rayfuse, *supra note* 1, p. 215.
140. Timo Koivurova and Erik J. Molenaar, *International Governance and Regulation of the Marine Arctic: A Proposal for a Legally Binding Instrument*, WWF International Arctic Programme, Oslo, 2010.
141. See *supra* note 9 for further references.
142. Hans Corell, "Reflections on the Possibilities and Limitations of a Binding Legal Regime", *Environmental Policy and Law*, 37(4), 2007, pp. 322–323; Oran R. Young, "The Arctic in Play: Governance in Time of Rapid Change", *The International Journal of Marine and Coastal Law*, vol.24, 2009, pp. 423–442, at p. 435.
143. Young, *supra* note 142, at pp. 432–433.
144. Young, *supra* note 142, at pp. 437–441.
145. Wang, supra note 78, p. 56–59.
146. Tanaka, *supra* note 56, p. 79–80.

between ecosystems and the maritime zones. Few of the 17 Arctic large marine ecosystems are confined within the jurisdiction of any one state. Therefore it is not realistic to expect Arctic coastal states to cede their rights under the Law of the Sea in favor of an international regime, even less so to refrain from exploiting natural resources or exercising other rights.[147]

Although the Law of the Sea approach seems to be the most realistic in the short term, it does not provide clear-cut answers. Regions are identified as the appropriate geographical and political unit for implementing obligations under the law of the sea.[148] States are required to co-operate on a regional basis to implement their general obligations on the conservation of transboundary living resources, and on the preservation and protection of the marine environment, LOS Convention Articles 63, 64, 118 and 197. The Arctic has developed as a region through co-operation with the Arctic Council in the past couple of decades.[149] The law of the sea approach is sector based. Within certain seas – enclosed or semi-enclosed seas – states are required to co-operate through a more holistic approach to the conservation and management of resources and the marine environment, LOS Convention Articles 122-123. These seas are either connected to others by a narrow outlet, or predominantly consist of areas within the jurisdiction of the coastal states. The coastal states are required to co-operate on several issues, including living marine resources, protection of the marine environment and scientific research, and providing for cross-sectoral co-operation. It is not evident that the Arctic Ocean qualifies.[150] In any case, the obligation to co-operate is not strong, and the coastal states are not accorded more or wider applicable rights or jurisdiction. Other states with legitimate interests in high seas fishing or navigation would by necessity have to be involved.

The most realistic outcome is to (gradually) develop separate legal agreements to fill gaps in the law of the sea, establishing a regional fisheries management organization for the high seas and a regional seas convention for the Arctic, through which the obligation to conserve biodiversity and sustainable use of its

147. Julia Jabour and Melissa Weber, "Is it Time to Cut the Gordian Knot of Polar Sovereignty?" *Review of European Community & International Environmental Law*, vol. 17 (1), 2008, pp. 27–40, at p. 28; Rayfuse, *supra* note 6, pp. 214–215.

148. Alan Boyle, "Globalism and regionalism in the protection of the marine environment". *In*: Davor Vidas (ed.). *Protecting the Polar Marine Environment. Law and Policy for Pollution Prevention*. Cambridge University Press: Cambridge, 2000, pp. 19–33 at p. 25 and pp. 29–30.

149. Koivurova and VanderZwaag, *supra* note 118, pp 121 ff.

150. Rothwell and Joyner, *supra* note 8, p. 19; Aldo Chircop, "The Growth of International Shipping in the Arctic: Is a Regulatory Review Timely?", *The International Journal of Marine and Coastal Law*, vol. 24, 2009, pp. 355–380, at pp. 364–365; Koivurova and Molenaar, *supra* note 6, pp. 42–43.

elements are implemented.[151] NEAFC and OSPAR may serve as models or have their areas of competence expanded to include larger parts of the marine Arctic. In such a context, the Arctic Council may continue to play the role (together with these regional regimes), as stipulated in its marine strategy: to coordinate the efforts towards an ecosystem approach, and integrated management of the Arctic Ocean through the appropriate legal instruments, both at a regional and a global level.[152]

5. Conclusions

The Arctic Ocean and its adjoining seas are subject to the same international legal standards as any other marine region. Not least because of the changes the region may undergo in the next decades, the challenge is to transform the obligations of conservation and sustainable use of Arctic marine biodiversity into practical legal terms. The analysis demonstrates extensive if not flexible obligations for the individual coastal states as well as the collectives of states; involving both challenges and opportunities. Since biodiversity is both transboundary and cross-sectoral, states are required to co-operate. The concept of the ecosystem approach signals a new and integrated approach to the protection of the environment and conservation of resources, both within and across sectors. Work has started through the Arctic Council to operationalize these obligations in the Arctic region. However, a comprehensive treaty on conservation and sustainable use of Arctic marine resources is unlikely, given the existing legal framework and the heterogeneous interests involved. The co-operation will have to be channeled through different regulatory regimes at both the regional and global level. The Arctic coastal states have a particular responsibility for overcoming the jurisdictional and sectoral hindrances to the conservation of biodiversity. Will they overcome the challenges and develop the opportunities? How will they use the Arctic Council?

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Туре Хенриксен / Tore Henriksen

Статус морской Арктики как последней неосвоенной территории может быть оспорен в будущем в связи с увеличивающейся активностью на ее

151. Likewise e.g. Young, *supra* note 142, p. 437.

152. AMSP, *supra* note 123, section 7.0 Strategic Actions.

территории, вызванной таянием арктических льдов. Разнообразная деятельность может поставить под угрозу хрупкую экосистему и среду обитания. В этой статье рассматривается международный закон об охране и рациональном использовании живых морских ресурсов, в рамках которого развивался экосистемный подход. Также эти правовые и неправовые нормы касаются и морской Арктики. Наиболее затрудненным оказывается воплощение экосистемного подхода в рамках существующей морской юрисдикции. Хотя Арктика все еще не освоена, государственная практика показывает, что развитие в Арктике легче от этого не будет, и что она не станет лабораторией новых правовых режимов. Наиболее вероятно, что секторные регулятивные режимы будут расширяться или развиваться по мере материализации разного рода угроз. Одной из проблем станет обеспечение должной координации по применению экосистемного подхода.