

Challenging the ‘Right to Fish’ in a Fast-Changing Ocean

Cassandra M. Brooks,^{*A} John B. Weller,^B
Kristina Gjerde,^C U. Rashid Sumaila,^D
Jeff Ardron,^E Natalie C. Ban,^F David Freestone,^G
Katherine Seto,^H Sebastian Unger,^E
Daniel P. Costa,^I Kara Fisher,^J Larry Crowder,^J
Patrick Halpin,^K & Andre Boustany^K

The 1982 United Nations Convention on the Law of the Sea and its 1995 implementing agreement for highly migratory and straddling fish stocks (the UN Fish Stocks Agreement) articulate the need for

* Acknowledgments: We appreciate the support of sponsors for the Stanford Law School Symposium *Emerging Perspectives on the Law, Science, and Policy of Dynamic Marine Conservation*. We further extend great appreciation to Martin Hall for his advice and input throughout the drafting of this article. We also thank two anonymous reviewers for their helpful comments and edits.

^A Corresponding Author: Stanford University, Emmett Interdisciplinary Program in Environment and Resources, 473 Via Ortega, Y2E2 Suite 226, Stanford, CA, USA, cbrooks1@stanford.edu.

^B 365 29th Street, Boulder, CO, USA

^C IUCN Global Marine and Polar Programme, 105 Irving St. Cambridge, MA, USA

^D Fisheries Centre, University of British Columbia, 2202 Main Mall, Vancouver, BC, Canada

^E Institute for Advanced Sustainability Studies (IASS), Berliner Straße 130, 14467 Potsdam, Germany

^F School of Environmental Studies, University of Victoria, PO Box 1700 STN CSC, Victoria, Canada

^G Sargasso Sea Alliance, Washington, DC, USA; Visiting Scholar, George Washington University Law School, Washington, DC, USA

^H Environmental Science, Policy, and Management, University of California, Berkeley, CA, USA

^I Department of Ecology & Evolutionary Biology, University of California, Santa Cruz, CA, USA

^J Center for Ocean Solutions, Stanford University, 99 Pacific Ave, Suite 555E, Monterey, CA, USA

^K Marine Geospatial Ecology Lab, Nicholas School of the Environment, Duke University, A328 LSRC Building, Durham, NC, USA

conservation of high seas marine living resources and precautionary ecosystem-based management. Unfortunately, the underlying historical paradigm in the high seas is the “right to fish,” without adhering to the broader conservation and environmental obligations on which those rights depend. The institutions that manage high seas living resources are largely limited to regional fisheries management organizations (RFMOs), comprised of state members with a direct economic interest in the fishery and largely applying single species approaches to management. As a result, these RFMOs have largely failed to meet the larger mandates under the United Nations and even their own Conventions. In contrast, the 1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR Convention) mandates the conservation of the marine ecosystem. Given the new stressors of the twenty-first century and swiftness with which the global ocean is changing due to climate change and other human impacts, Best Practice Guidelines for RFMOs urge fisheries institutions to have mechanisms to respond to extreme environmental or other unpredictable events. Marine protected areas (MPAs) remain an effective tool for managing marine living resources and can help safeguard marine ecosystems in an uncertain future. Yet their application on the high seas has been limited thus far, with even CCAMLR struggling to adopt measures. Here we offer potential reforms that will enable RFMOs to better address the environmental and biodiversity directives of the UN agreements, and further explore avenues for reframing the “right to fish” in the twenty-first century.

I.	THE DEATH OF A BEAUTIFUL HYPOTHESIS AND THE END OF THE FREEDOM OF THE SEAS.....	291
II.	FAILING THE HIGH SEAS	297
III.	CCAMLR’S PARADIGM: PERMISSION TO FISH.....	303
IV.	MARINE PROTECTED AREAS AS A MANAGEMENT TOOL IN A CHANGING OCEAN.....	306
V.	THE CHALLENGE OF MPAS IN AREAS BEYOND NATIONAL JURISDICTION	309
VI.	RFMO REFORM FOR MANAGING A DYNAMIC OCEAN	316
VII.	REFRAMING THE RIGHT TO FISH	320

I. THE DEATH OF A BEAUTIFUL HYPOTHESIS AND THE END OF THE FREEDOM OF THE SEAS

In 1608, Dutch jurist Hugo Grotius declared in his seminal work, *Mare Liberum*, that the sea was open to all nations, and that the fish it contained were also free to all men.¹ The political motivations² behind Grotius' treatise aside, the "Freedom of the Seas" must have seemed appropriate: then, and for centuries later, ocean resources appeared infinite, at least relative to the demand for fish.

Thomas Henry Huxley, one of the great biologists of the 19th century, gave the keynote presentation at the first Fishery Congress in 1883. As part of his address, he was asked to comment on the rising question of whether overfishing ocean stocks was possible. His assessment was this:

. . . I believe, then, that the cod fishery, the herring fishery, the pilchard fishery, the mackerel fishery, and probably all the great sea fisheries, are inexhaustible; that is to say, that nothing we do seriously affects the number of the fish. And any attempt to regulate these fisheries seems consequently, from the nature of the case, to be useless.³

Despite his optimistic assessment on the state of global fisheries, Huxley also said that "[t]he great tragedy of science [is] the slaying of a beautiful hypothesis by an ugly fact,"⁴ and the ugly facts were beginning to mount. Enabled by new technologies and driven by an increasing population, a rising demand for fish, and dwindling resources close to home, fishing vessels ventured further from their homeports, encroaching into the customary fishing territories of other countries, as well as fishing deeper than ever before.⁵ International disputes over fishing territories, along with a growing awareness that marine living resources were not inexhaustible,

1. Garry R. Russ & Dirk C. Zeller, *From Mare Liberum to Mare Reservarum*, 27 MARINE POL'Y 75, 76 (2003) (relaying Grotius' writing).

2. Grotius was contracted by the Netherlands to write *Mare Liberum* in defense of their right to participate in trading activities in the Indian Ocean. The sub-title of Grotius' work is *de jure quod Batavis competit ad Indicana commercia*, which translates to "the right which belongs to the Dutch to take part in the East Indies trade."

3. Thomas H. Huxley, Inaugural Address for the Fisheries Exhibition, London (June 18, 1883), available at <http://aleph0.clarku.edu/huxley/SM5/fish.html>.

4. Thomas H. Huxley, Presidential Address at the British Ass'n, London (1870).

5. Wilf Swartz et al., *The Spatial Expansion and Ecological Footprint of Fisheries (1950 to Present)*, 5(12) PLOS ONE 1, 1 (2010) (recounting the depletion of fish stocks by modern industrial fisheries, beginning in 1880). See generally Telmo Morato et al., *Fishing Down the Deep*, 7 FISH & FISHERIES 24, 24-25 (2006) (showing that fishing fleets have expanded into progressively deeper waters).

initially led states to form international agreements (e.g., the 1911 North Pacific Fur Seal Treaty) and the first regional fisheries management organizations (RFMOs, e.g., the 1923 International Pacific Halibut Commission). Yet multilateral disputes over fisheries continued to erupt, and by the middle of the twentieth century, the dissonance had reached a breaking point.⁶ The result was the three United Nations Conferences on the Law of the Sea between 1958 and 1982, intended to codify the international law of the sea. The 1982 United Nations Convention on the Law of the Sea (UNCLOS),⁷ which was the outcome of the third conference, included, for the first time, the concept of the exclusive economic zone (EEZ). The EEZ recognized the sovereign rights of coastal states over the marine resources of the seabed and water column out to 200 nautical miles from their coastlines.⁸ It was hoped by the drafters at UNCLOS III that the newly defined EEZs would allow countries to better manage the marine resources within these boundaries. UNCLOS also set up general mandates for managing the sea areas beyond national jurisdiction, i.e., the high seas.⁹

On the high seas, the concept of “freedom of the seas” is sometimes interpreted as an unfettered right to fish.¹⁰ However, nothing could be further from the truth under UNCLOS and modern international law. While article 87 of UNCLOS stipulates that “[t]he high seas are open to all States, whether coastal or land-locked,” it requires that “freedom of the high seas [be] exercised according to the conditions laid down by this Convention and other rules of international law.”¹¹ As further discussed below, these provisions of the 1982 convention are generally regarded as representing customary international law, meaning that they are binding upon

6. See, e.g., Bruce Mitchell, *Politics, Fish, and International Resource Management: The British-Icelandic Cod War*, 66 AM. GEOGR. REV. 127, 128 (1976) (describing the “cod wars” between Iceland and the United Kingdom in the North Atlantic).

7. 1833 U.N.T.S. 3.

8. 1833 U.N.T.S. 3, art. 55.

9. See generally 1833 U.N.T.S. 3, art. 133-91 (governing mineral resources of the seabed set up by 1994 agreement regarding Implementation of Part XI of UNCLOS); David Freestone, *The Final Frontier: The Law of the Sea Convention and Areas beyond National Jurisdiction*, in PROCEEDINGS OF THE 2012 LAW OF THE SEA INSTITUTE CONFERENCE: SECURING THE OCEAN FOR THE NEXT GENERATION 69, 73-80 (Harry N. Scheiber & Moon Sang Kwon eds., 2013).

10. Russ & Zeller, *supra* note 1, at 76 (referencing this interpretation).

11. 1833 U.N.T.S. 3, art. 87. Activities permitted on the high seas include: navigation, over-flight, laying of submarine cables and pipelines, construction of artificial islands and other installations, scientific research, and fishing.

states party to the convention, as well as those—such as the United States—not party to the convention. These conditions are quite onerous.

States fishing on the high seas have a range of duties, including obligations to regulate and enforce the activities of their nationals for the conservation of the living resources of the high seas,¹² to cooperate with other states in conservation and management of those resources,¹³ and to base their activities “on the best scientific evidence available, environmental and economic factors, and ‘generally recommended international minimum standards.’”¹⁴ Additionally, fishing states are required to cooperate with regional management organizations (e.g., RFMOs), particularly for stocks that cross EEZ boundaries¹⁵ and in relation to highly migratory species.¹⁶ Under both the 1982 convention and customary international law more generally, there are clearly stated, overarching, and unconditional obligations to “protect and preserve the marine environment,”¹⁷ to prevent and control pollution,¹⁸ and to protect and preserve rare or fragile species and ecosystems in all parts of the marine environment, as well as the habitats of depleted, threatened, or endangered species and other forms of marine life.¹⁹ States are also required to take measures to prevent the intentional or accidental introduction of alien species.²⁰

Despite UNCLOS’ comprehensive mandate, article 61, entitled “conservation of the living resources,” focuses on fisheries and hence it is little surprise that management to date has likewise had this emphasis, often at the expense of maintaining or restoring populations of other affected species, as required under article 61(4).²¹ The issue of how to deal with shared fish stocks—those that

12. 1833 U.N.T.S. 3, art. 117.

13. 1833 U.N.T.S. 3, art. 118.

14. 1833 U.N.T.S. 3, art. 119, cl. 1(a). *See also* David Freestone, *International Governance, Responsibility and Management of Areas Beyond National Jurisdiction*, 27 INT’L. J. MARINE & COASTAL L., 191, 201 (2012) (summarizing the duties of states under Articles 116-20).

15. 1833 U.N.T.S. 3, art. 63, cl. 1.

16. 1833 U.N.T.S. 3, art. 64, cl. 1.

17. 1833 U.N.T.S. 3, art. 192.

18. *See, e.g.*, 1833 U.N.T.S. 3, art. 145.

19. 1833 U.N.T.S. 3, art. 194-95.

20. 1833 U.N.T.S. 3, art. 196.

21. *See generally* Food & Agric. Org. of the U.N., Fisheries & Aquaculture Dep’t, *The State of World Fisheries and Aquaculture, 2012*, available at <http://www.fao.org/docrep/016/i2727e/i2727e.pdf>.

utilize national and high seas waters—has remained unsolved.²²

It has been reported that the majority of global ocean fish harvests are of species captured both in exclusive economic zones (EEZs) and in the high seas (54 million tons, or 68% of global fish harvests).²³ The intense overexploitation of straddling and highly migratory fish stocks compromised national attempts to manage EEZ segments of the stock and ultimately led to the 1993/5 UN Conference on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, mandated by the 1992 Rio Conference on Environment and Development, leading to the 1995 United Nations Fish Stocks Agreement (UNFSA).²⁴

The UNFSA, an implementing agreement to UNCLOS, further expanded state obligations,²⁵ particularly in relation to cooperation in the management of highly migratory and straddling fish stocks,²⁶ as well as the conservation of marine ecosystems as a whole. The UNFSA stipulates that coastal states, as well as states fishing on the high seas, “shall assess the impacts of fishing, other human activities and environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stock.”²⁷ Under Article 5, states are to adopt measures that minimize pollution, waste, and bycatch, while also protecting biodiversity.²⁸ Further, states are to develop measures to eliminate

22. Gordon Munro, Annick Van Houtte, & Rolf Willmann, *The Conservation and Management of Shared Fish Stocks: Legal and Economic Aspects*, FAO FISHERIES TECHNICAL PAPER, No. 465 (2004).

23. Alex D. Rogers et al., *The High Seas and Us: Understanding the Value of High-Seas Ecosystems*, REPORT OF THE GLOBAL OCEAN COMMISSION (2014).

24. United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/5/Rev.1, Agenda 21, ¶ 17.49-50 (June 13, 1992); United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks, New York, N.Y., July 24-Aug. 4, 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*, U.N. Doc A/CONF.164/37, (Sept. 8, 1995) (in force as of Dec. 11, 2001) [hereinafter UNFSA], available at http://www.un.org/depts/los/convention_agreements/texts/fish_stocks_agreement/CONF164_37.htm.

25. United Nations Food and Agriculture Organization, *Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas* (FAO Compliance Agreement) (1993), available at http://www.fao.org/fileadmin/user_upload/legal/docs/012t-e.pdf (seeking to tighten controls, but only has 39 parties to date).

26. That is, those that cross from national EEZs to the high seas and back.

27. UNFSA, Art. 5.

28. *Id.*

overfishing and restore stocks to levels that can support maximum sustainable yield.²⁹ These measures are to be based on the best scientific evidence available and, as defined in Article 6, a precautionary approach.³⁰ Indeed, Annex II sets out, for the first time, a clear methodology for the application of the precautionary approach to capture fisheries.³¹ States are also to share data and promote research in support of fishery conservation and management.³²

The UNFSA sought to strengthen the role of RFMOs by appointing them as the key medium through which states would cooperate in sustainably managing fish stocks, including those that straddle the high seas and national jurisdiction.³³ The agreement laid out a set of rules for RFMOs to manage stocks in their jurisdiction. These rules include: agreements on developing measures to promote sustainable fishing (e.g., setting catch limits and allocations or caps on fishing effort); agreements on measures for adopting more effective, timely, and scientifically advised decision-making procedures; and agreements on ensuring compliance and enforcement through monitoring, control and surveillance.³⁴ Currently, twenty RFMOs have the responsibility for the management of various stocks on the high seas (Figures 1 and 2). These areas cover those utilized by most tuna and tuna-like species, with some gaps in coverage for non-tuna fisheries (Figure 2).³⁵ The UNFSA currently has eighty-one parties, and is also regarded by many (although not all) states as representing customary international law as well as “generally recommended international minimum standards” that should apply to all fisheries.³⁶ In short, the “freedom to fish” is a strongly

29. *Id.*

30. *Id.* at 6.

31. *Id.* at Annex II.

32. *Id.*

33. *Id.* at Arts. 10-16.

34. UNFSA, Art. 10.

35. Food and Agricultural Organization (FAO), *Regional Fishery Bodies – Fishery Governance Fact Sheets*. For reasons of space, regional fisheries bodies without management mandates (i.e., advisory only) will not be discussed, but they are also important for regional governance. See also Natalie C. Ban et al., *Systematic Conservation Planning: A Better Recipe for Managing the High Seas for Biodiversity Conservation and Sustainable Use*, 7(1) CONSERVATION LETTERS 41, 44-45 figs. 1 & 2 (2013) (depicting the geographic coverage of tuna and non-tuna RFMOs).

36. See David Freestone, *A Decade of the Law of the Sea Convention: Is It a Success?* 39 GEO. WASH. INT'L L. REV. 499, 525 (2007).

conditional freedom.³⁷

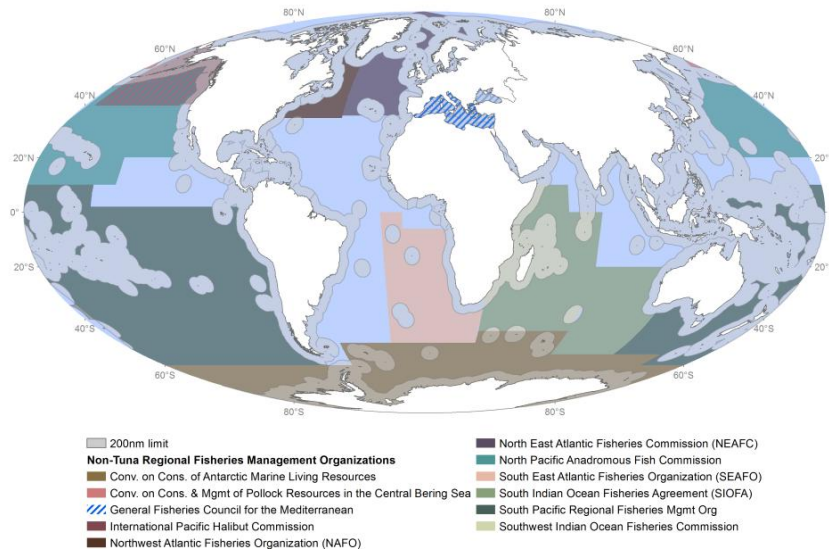


Figure 1. RFMOs that manage bottom fisheries and species other than tunas. See *supra* note 35.

37. See David Freestone, *Modern Principles of High Seas Governance: The Legal Underpinnings*, 39 ENVTL. POL'Y & L. 44, 45 (2009).

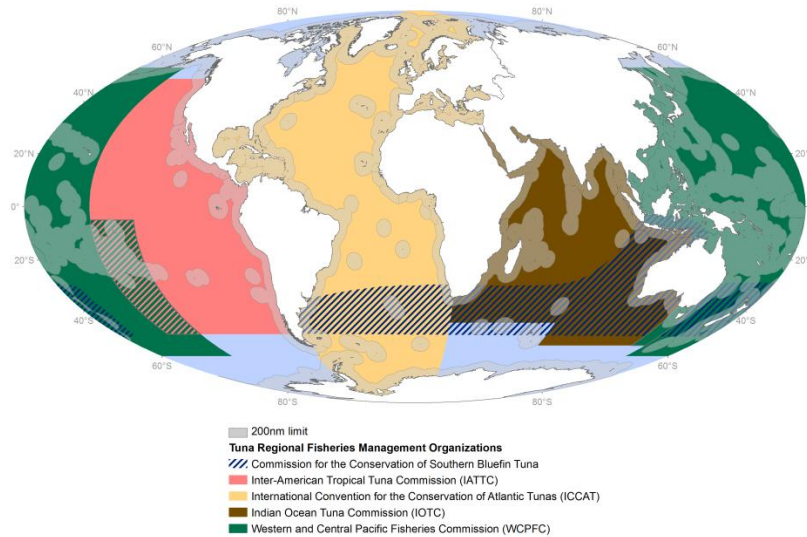


Figure 2. RFMOs that manage tuna and tuna-like species. See *supra* note 35.

II. FAILING THE HIGH SEAS

As the primary means of developing high seas fisheries conservation and management and for achieving international cooperation among fishing states, RFMOs lie at the heart of global fisheries governance. Their effectiveness, as Cullis-Suzuki and Pauly point out, can be measured by assessing whether or not a RFMO has met its main goal.³⁸ By and large, that goal is stated as the sustainable use of the species that fall under the RFMO's jurisdiction, with the newer (or revised) agreements having some conservation objectives as well.³⁹ Nevertheless, RFMOs are falling short of meeting the overarching mandates of international law and their own objectives.⁴⁰ Two-thirds of stocks under RFMO

38. Sarika Cullis-Suzuki & Daniel Pauly, *Failing the High Seas: A Global Evaluation of Regional Fisheries Management Organizations*, 34 MARINE POL'Y 1036, 1036 (2010).

39. As, e.g., the Northwest Atlantic Fisheries Organization, the International Commission for the Conservation of Atlantic Tunas, the South Pacific Regional Fisheries Management Organization, and the Western and Central Pacific Fisheries Commission.

40. See ANTHONY COX ET AL., STRENGTHENING REGIONAL FISHERIES MANAGEMENT ORGANIZATIONS (OECD, 2009) (examining four RFMOs and finding room for improvement in all, with a varying degree of success among RFMOs in the ability to improve on management practices); MICHAEL W. LODGE ET AL., RECOMMENDED BEST PRACTICES FOR REGIONAL FISHERIES MANAGEMENT ORGANIZATIONS (Chatham House, 2007) (identifying shortcomings in, and suggesting improvement for, the current RFMO management structure); ALEX D. ROGERS & MATTHEW GIANNI, THE IMPLEMENTATION OF UNGA RESOLUTIONS 61/105 AND 64/72 IN THE MANAGEMENT OF DEEP-SEA FISHERIES ON THE HIGH SEAS (International Programme on the State

management are depleted or overfished.⁴¹ In perhaps one of the worst RFMO performance examples, the Report of the Independent Performance Review of ICCAT (the International Commission for the Conservation of Atlantic Tunas) stated, “ICCAT CPCs’⁴² performance in managing fisheries on bluefin tuna particularly in the eastern Atlantic and Mediterranean Sea is widely regarded as an international disgrace.”⁴³ Although performance reviews of other RFMOs have not been so damning, all have clearly demonstrated that there is ample room for improvement, including, *inter alia*, better cooperation with other regional governance bodies.⁴⁴

Not only are RFMOs failing to achieve their own stated mandates by preventing overfishing of the fish stocks under their management,⁴⁵ but even if these organizations were succeeding by that measure, the goals of most RFMOs are potentially not sufficient to ensure the future health of the stocks, ecosystems, and habitats under their charge. It is widely acknowledged that single-species management is usually inadequate to sustainably manage fisheries.⁴⁶ Yet most RFMOs continue to aspire to single-species, or at most multiple-species management rather than taking an ecosystem-based and precautionary approach.⁴⁷ Moreover, many

of the Ocean, 2010); Cullis-Suzuki & Pauly, *supra* note 38 (noting the percentage of depleted and overfished stocks under RFMO management); Kristina M. Gjerde et al., *Ocean in Peril: Reforming the Management of Global Ocean Living Resources in Areas Beyond National Jurisdiction*, 74 MARINE POLLUTION BULL. 540, 542 (2013).

41. Cullis-Suzuki & Pauly, *supra* note 38, at 1039.

42. “CPCs” refers to contracting parties, and cooperating non-contracting parties, entities, or fishing entities.

43. 2008 INT’L COMM’N FOR THE CONSERVATION OF ATL. TUNAS PERFORMANCE REVIEW, REPORT OF THE INDEPENDENT PERFORMANCE REVIEW OF ICCAT at 2 (2009).

44. *See generally* COMM’N FOR THE CONSERVATION OF S. BLUEFIN TUNA, PART TWO, REPORT OF THE INDEPENDENT EXPERT (2008); COMM’N FOR THE CONSERVATION OF S. BLUEFIN TUNA, REPORT OF THE PERFORMANCE REVIEW WORKING GROUP (2008); INDIAN OCEAN TUNA COMM’N, REPORT OF THE IOTC PERFORMANCE REVIEW PANEL (2009); NE. ATL. FISHERIES COMM’N, REPORT OF THE NORTH EAST ATLANTIC FISHERIES COMMISSION: PERFORMANCE REVIEW PANEL REPORT OF THE NORTH EAST ATLANTIC FISHERIES COMMISSION (2006); W. AND CENT. PAC. FISHERIES COMM’N TECHNICAL & COMPLIANCE COMM., REVIEW OF THE PERFORMANCE OF THE WCPFC (2012); GLENN D. HURRY ET AL., REPORT OF THE INDEPENDENT REVIEW (International Commission for the Conservation of Atlantic Tunas, 2008).

45. LODGE ET AL., *supra* note 40, at 40 (noting the problems of non-compliance and delay in implementing measures to control overfishing); Cullis-Suzuki & Pauly, *supra* note 38, at 1039 (reporting the proportion of depleted or overfished stocks).

46. Ban et al., *supra* note 35, at 46 (noting that ecosystem-based management is widely called for); DANIELA DIZ PEREIRA PINTO, FISHERIES MANAGEMENT IN AREAS BEYOND NATIONAL JURISDICTION, ch. 5, at 117-57 (Martinus Nijhoff Publishers, 2013).

47. *See* UNFSA, *supra* note 31, at Annex II; *see also* MARJORIE L. MOONEY-SEUS & ANDREW A. ROSENBERG, RECOMMENDED BEST PRACTICES FOR REGIONAL FISHERIES MANAGEMENT

RFMOs lack adequate enforcement, compliance, and associated reporting mechanisms.⁴⁸

Gjerde et al. highlight some potential reasons why RFMOs have struggled thus far in carrying out their mandates.⁴⁹ First, most RFMOs are comprised mainly of states with interests in enhancing or maintaining their domestic fishing opportunities,⁵⁰ leading to the pursuit of short-term gains over long-term sustainable fishing. Sumaila and Walters⁵¹ articulated this point in economic terms through the concept of discounting, i.e., the process by which benefits to be received in the future are reduced to a present value.⁵² Second, RFMOs and their member states suffer few consequences for poor performance or overfishing, other than possibly lost fishing opportunities in the remote future. Distant water fishing fleets have, in the past, been able to swiftly shift to more fertile grounds. Outside of the compliance mechanisms of RFMOs such as blacklists, few, if any, penalties exist at the international level for failing to follow UN fisheries resolutions and best-practice standards such as the Food and Agricultural Organization (FAO) Code of Conduct for Responsible Fisheries.⁵³ However, the FAO's Port State Measures Agreement, should sufficient states vote to ratify it, could help to fill this gap.⁵⁴ Third,

ORGANIZATIONS: TECHNICAL STUDY NO. 1 at 7 (Chatham House, 2007) (discussing the case of single species management for krill in CCAMLR).

48. See generally Eric Gilman & Eric Kingma, *Standard for Assessing Transparency in Information on Compliance with Obligations of Regional Fisheries Management Organizations: Validation Through Assessment of the Western and Central Pacific Fisheries Commission*, 84 OCEAN & COASTAL MGMT. 31 (2013) (setting out assessment criteria for RFMO transparency); Dorota Engleder et al., *Cooperation and Compliance in Areas Beyond National Jurisdiction*, MARINE POL'Y (forthcoming 2013), available at www.sciencedirect.com/science/article/pii/S0308597X13002819.

49. Gjerde et al., *supra* note 40, at 543.

50. A few select fisheries or marine living resource organizations do contain non-fishing states, e.g., CCAMLR, IWC, and Inter-American Tropical Tuna Commission (IATTC).

51. See U. Rashid Sumaila & Carl Walters, *Intergenerational Discounting: A New Intuitive Approach*, 52 ECOLOGICAL ECON. 135 (2005) (proposing a new discounting approach for computing net benefits from the use of environmental resources, which explicitly incorporates the perspectives of both the current and future generations).

52. See Kenneth Arrow et al., *Determining Benefits and Costs for Future Generations*, 341 SCIENCE 349, 349 (2013) (explaining how discount rates work).

53. Rosemary Rayfuse, *To Our Children's Children's Children: From Promoting to Achieving Compliance in High Seas Fisheries*, 20 INT'L J. MARINE & COASTAL L. 509, 532 (2005).

54. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, AGREEMENT ON PORT STATE MEASURES TO PREVENT, DETER AND ELIMINATE ILLEGAL, UNREPORTED AND UNREGULATED FISHING (2009), <http://www.fao.org/fishery/topic/166283/en>. This measure needs to be ratified by twenty-five states to come into force, but has only been ratified by nine states thus far.

the paradigm of regional institutions may be ill suited to a globalized world. Many RFMOs may have originated from a small number of states with a shared dependence on, and vested interest in, a common resource (likely a fish stock adjacent to or straddling their EEZ and/or a small number of distant water fishing states).⁵⁵ Yet in the current world of global fisheries, a vessel fishing the high seas may fly a flag from one state, with a captain from another, a crew from several more, and ownership by a largely stateless multinational corporation that may belong to holding companies in one or more other jurisdictions.⁵⁶ Further, vessels that fish the high seas can fish a resource to local commercial extinction and then move on, not feeling the effect of the local depletion.⁵⁷ Finally, most RFMOs maintain the position that member states are allowed to fish unless they reach agreement (generally achieved via consensus) not to fish or to restrict fishing. This creates a perverse incentive not to reach fisheries agreements since any agreement would limit a state's total allowable catch, and hence their "freedom to fish." Consequently, fishing limits are often only adopted following stock collapse or after severe environmental impacts have ensued (e.g., the case of jack mackerel in the South Pacific or of southern bluefin tuna in the Atlantic).⁵⁸ Even then, in the midst of declining stocks and immediate need for quick action to reverse the downward trends, decision-making often becomes paralyzed as states compete to gain a portion of a diminishing catch quota.⁵⁹

55. Moira L. McConnell, *Observations on Compliance and Enforcement and Regional Fisheries Institutions: Overcoming the Limitations of the Law of the Sea*, in RECASTING TRANSBOUNDARY FISHERIES MANAGEMENT ARRANGEMENTS IN LIGHT OF SUSTAINABILITY PRINCIPLES: CANADIAN AND INTERNATIONAL PERSPECTIVES 71, 79 (Dawn A. Russell & David A. VanderZwaag eds., 2010).

56. ROSEMARY RAYFUSE, *NON-FLAG STATE ENFORCEMENT IN HIGH SEAS FISHERIES* (Martinus Nijhoff Publishers, 2004).

57. Fikret Berkes et al., *Globalization, Roving Bandits, and Marine Resources*, 311 SCIENCE 1557, 1557 (2006) (identifying this problem); SWEDISH FAO COMM., *ROVING BANDITS IN MODERN FISHERIES*, *passim* (2009), <http://www.government.se/content/1/c6/12/11/81/d99cc30a.pdf>.

58. Gjerde et al., *supra* note 40, at 544; Elizabeth A. Hayes, *A REVIEW OF THE SOUTHERN BLUEFIN TUNA FISHERY: IMPLICATIONS FOR ECOLOGICALLY SUSTAINABLE MANAGEMENT* at 1 (A TRAFFIC Oceania Report, 1997), www.traffic.org/species-reports/traffic_species_fish1.pdf (referencing conservation measures that lagged the decline in population); *see also* Carl Safina & Dane H. Klinger, *Collapse of Bluefin Tuna in the Western Atlantic*, 22 CONSERV. BIOLOGY 243 (2008) (reporting on the reduction in Bluefin tuna quota after catches had already declined significantly).

59. LODGE ET AL., *supra* note 40, at 33-34.

Other reasons provided in Sumaila et al.⁶⁰ for the ineffectiveness of RFMOs are: RFMOs have limited powers to enforce their rules; the free rider problem, i.e., states that choose not to join RFMOs continuing to fish outside of RFMO rules and thus undermining conservation measures; illegal, unreported, and unregulated (IUU) fishing is widespread on the high seas;⁶¹ huge subsidies are paid to the fishing sector in many countries, fueling fishing on the high seas;⁶² and it is incredibly expensive to monitor the currently existing wide array of diverse management strategies.

The root of RFMO shortcomings, according to Lodge et al., is a “lack of political will by fishery managers and marine resource users to implement management measures according to scientific advice and effectively enforce and comply with those management measures.”⁶³ For example, the United Nations General Assembly’s (UNGA) 2011 review of compliance with its bottom fishing resolutions 61/105 and 64/72—which praises RFMO efforts in limiting the spread of bottom fishing—also points out that more work is needed to fully implement the UNGA’s call for protecting “vulnerable marine ecosystems” and ensuring the sustainability of deep sea fish stocks on the high seas.⁶⁴ Moreover, despite the agreement among world leaders at the 2002 World Summit on Sustainable Development (WSSD) to establish a global network of marine protected areas (MPAs) by 2012, RFMOs have resisted closing areas for biodiversity conservation purposes—other than under pressure of the above UNGA resolutions on deep sea bottom fishing and the protection of vulnerable marine ecosystems.⁶⁵ Only CCAMLR (the Commission for the Conservation of Antarctic Marine

60. U. Rashid Sumaila et al., *Potential Costs and Benefits of Marine Reserves in the High Seas*, 345 MARINE ECOLOGY PROGRESS SERIES 305, 306 (2007).

61. HIGH SEAS TASK FORCE, CLOSING THE NET: STOPPING ILLEGAL FISHING ON THE HIGH SEAS at 3 (2006). Note that some RFMOs, including CCAMLR, have taken progressive steps to reduce IUU fishing. These include the use of vessel monitoring systems, port state measures and catch documentation schemes. See, e.g., Henrik Osterblom & U. Rashid Sumaila, *Toothfish Crises, Actor Diversity, and the Emergence of Compliance Mechanisms in the Southern Ocean*, 21 GLOBAL ENV'T'L CHANGE 972 (2011).

62. *Catching More Bait: A Bottom-Up Re-Estimation of Global Fisheries Subsidies*, UNIV. OF B.C. FISHERIES CENTRE RES. REP., 2006, at 1, 6.

63. LODGE ET AL., *supra* note 40, at 134.

64. U.N. GAOR, 66th Sess., 566th mtg. at 3, U.N. Doc. A/66/566 (Nov. 18, 2011), available at http://www.un.org/ga/search/view_doc.asp?symbol=A/66/566.

65. Pursuant to the public pressure and global scrutiny leading up to and resulting in UNGA resolutions 61/105 and 64/72, most non-tuna RFMOs such as NEAFC, NAFO and SPRFMO have closed some seabed areas to bottom fishing to protect biodiversity. However, these same RFMOs have frequently failed to implement the full set of requirements set forth in the UNGA resolutions 61/105 and 64/72. See ROGERS & GIANNI, *supra* note 40, at 3.

Living Resources), the arm of the Antarctic Treaty System responsible for managing the marine living resources in the Southern Ocean,⁶⁶ has sought to use its mandate to establish a system of MPAs for wider biodiversity conservation purposes.⁶⁷ Several RFMOs have established spatial, temporal, or gear restricted closures (e.g., ICCAT enforces seasonal limitations on purse seining for bluefin tuna in the Mediterranean Sea,⁶⁸ a time-area closure on fishing for tunas on fish aggregating devices in the Gulf of Guinea⁶⁹ and a prohibition on targeting bluefin tuna on the Gulf of Mexico spawning ground⁷⁰). However, none of these constitute full “no-take” zones, and the closure periods do not necessarily coincide with the peak in fish availability. No RFMOs have utilized systems of representative MPAs for biodiversity conservation purposes in their management framework, perhaps indicating a bias in their objectives towards a “right to fish” at the potential expense of ecosystem health.

66. While CCAMLR is responsible for managing the Southern Ocean ecosystem and regulates the exploitation of fish and invertebrates, the 1946 International Whaling Commission and the 1973 Convention for the Conservation of Antarctic Seals regulate the exploitation of whales and seals respectively.

67. Gjerde et al., *supra* note 40, at 7. CCAMLR maintains the capacity to establish closed areas under CAMLR Convention, Art. IX(2)(g): “[T]he designation of 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[.]” CONVENTION FOR CONSERV. OF ANTARCTIC MARINE LIVING RES. art. IX(2)(g), May 20, 1980, 33 U.S.T. 3476, available at <http://www.ccamlr.org/en/organisation/camlr-convention-text>. They have taken this a step further in adopting the South Orkney Islands Southern Shelf MPA and Conservation Measure 91-04, which outlines MPAs to include, among other things: management and research and monitoring plans, as well as specific objectives, including scientific reference areas for monitoring natural and human-induced changes. CCAMLR, *Conservation Measure 91-04: General Framework for the Establishment of CCAMLR Marine Protected Areas*, 2011, available at <https://www.ccamlr.org/sites/drupal.ccamlr.org/files//91-04.pdf>.

68. Int’l Comm’n for the Conserv. of Atlantic Tuna, *Recommendation by ICCAT Amending the Recommendation by ICCAT to Establish a Multi-Annual Recovery Plan for Bluefin Tuna in the Eastern Atlantic and Mediterranean*, at 2, 4, 15, 26, ICCAT Doc. BFT 12-03, available at <http://www.iccat.int/Documents%5CRecs%5Ccompendiopdf-e%5C2012-03-e.pdf>.

69. Int’l Comm’n for the Conserv. of Atlantic Tuna, *Recommendation by ICCAT on a Multi-Year Conservation and Management Program for Bigeye Tuna*, at 2, ICCAT Doc. BET 04-01, available at <http://www.iccat.int/Documents/Recs/compendiopdf-e/2004-01-e.pdf>.

70. Int’l Comm’n for the Conserv. of Atlantic Tuna, *New Regulations for the Atlantic Bluefin Tuna Catch*, at 2, ICCAT Doc. BFT 82-1 (1983), available at <http://www.iccat.int/Documents%5CRecs%5Ccompendiopdf-e%5C1982-01-e.pdf>.

III. CCAMLR's Paradigm: Permission to Fish

More than a fisheries management body, CCAMLR has the explicit objective to conserve marine living resources.⁷¹ Article II of the Convention states, *inter alia*, that any harvesting and associated activities must be conducted in accordance with the following principles of conservation: (a) within biological limits, preventing of decrease in the size of any harvested population to levels below those which ensure its stable recruitment; (b) within ecological limits, maintaining the ecological relationships between harvested, dependent and related biological populations; and (c) taking a precautionary approach, preventing changes or minimizing the risk of changes in the marine ecosystem which are not potentially reversible over two or three decades.⁷² As a result fishing is not permitted unless members reach an agreement to fish. Importantly, access is not automatic. Rather, CCAMLR fishing members must notify their intent to fish every year at the annual CCAMLR meeting and the Commission must then approve their notification via consensus. Further, all directed fishing is governed by conservation measures adopted by the Commission, so there are no unregulated fisheries. Notably, CCAMLR and the International Whaling Commission (IWC) are the only high seas resource management bodies in which a substantial percentage of members do not engage in commercial exploitation.⁷³

The CAMLR Convention defines conservation to include "rational use," which allows for scientific and commercial harvesting of living resources under the conditions noted above. Accordingly, CCAMLR employs a highly science-based precautionary and ecosystem-based management approach, striving to take into account the complex relationships between organisms as well as physical oceanographic processes.⁷⁴ As new data become available, they are actively incorporated into CCAMLR's management, and

71. CONVENTION ON THE CONSERV. OF ANTARCTIC MARINE LIVING RES. art. II(1), *supra* note 67, at 3476.

72. CONVENTION ON THE CONSERV. OF ANTARCTIC MARINE LIVING RES. art. II(3)(a-c), *supra* note 67, at 3476.

73. CCAMLR currently has roughly 3-to-5 ratio of non-fishing to fishing members. Cassandra Brooks, *Competing Values on the Antarctic High Seas: CCAMLR and the Challenge of Marine Protected Areas*, 3(2) POLAR J. 277, 295 (2013).

74. David J. Agnew, *The CCAMLR Ecosystem Monitoring Programme*, 9 ANTARCTIC SCI. 235, 236-42 (1997); Andrew J. Constable, *Lessons from CCAMLR on the Implementation of the Ecosystem Approach to Managing Fisheries*, 12 FISH & FISHERIES 138, 142-51 (2011); Karl H. Kock, *Antarctic Marine Living Resources—Exploitation and Its Management in the Southern Ocean*, 19 ANTARCTIC SCI. 231, 234-38 (2007).

uncertainties and data gaps are also considered.⁷⁵ CCAMLR's Ecosystem Monitoring Program, which lays the foundation for actively monitoring the effect of the krill fishery on land-based predators, such as seabirds and seals (while also having the capacity to reveal ecosystem changes from climate change or other factors), has been exemplary of CCAMLR's ecosystem-based management.⁷⁶ Aiding and enabling this objective, CCAMLR governs an area mostly encompassing discrete ecosystems within the Southern Ocean, as isolated by the Antarctic Convergence⁷⁷—rather than a fragment of an ecosystem or a single stock.⁷⁸

CCAMLR's unique approach to management stems from its foundations in the Antarctic Treaty, which—negotiated as it was during the height of the Cold War—set aside the entire Antarctic continent in the name of peace and science.⁷⁹ CCAMLR was negotiated in the 1970s as the ocean component to the Antarctic Treaty System (ATS), exemplifying many of the same foundational values with the visionary aspiration of managing whole ecosystems based on the best available science. The original twelve signatories to the Antarctic Treaty were also among the original fifteen CCAMLR states, and CCAMLR's preamble links directly to the original objectives of the Antarctic Treaty of fostering peace and science in the Antarctic.⁸⁰

CCAMLR maintains obligations to both the Antarctic Treaty and its Environmental Protocol. Indeed, Article V of the CAMLR Convention provides that contracting parties that are not parties to the Antarctic Treaty nonetheless acknowledge the special obligations and responsibilities of the Antarctic Treaty Consultative

75. Denzil Miller, *Sustainable Management in the Southern Ocean: CCAMLR Science*, in *SCIENCE DIPLOMACY: ANTARCTICA, SCIENCE, AND THE GOVERNANCE OF INTERNATIONAL SPACES* 105 (Paul Arthur Berkman et al. eds., 2011).

76. Agnew, *supra* note 74, at 236-42; Constable, *supra* note 74, at 142-51; Kock, *supra* note 74, at 234-38.

77. Notwithstanding a few fisheries prosecuted around sub-Antarctic islands within national jurisdiction. See *Statement by the Chairman*, CONFERENCE ON THE CONSERV. OF ANTARCTIC MARINE LIVING RES., <http://www.ccamlr.org/en/organisation/camlr-convention-text#Chair>.

78. Rather than following the governance boundaries of the Antarctic Treaty, which extend only to 60°S, CCAMLR set up more biologically meaningful boundaries that roughly correlate with the Antarctic Convergence. See *Convention Area Boundaries*, CONFERENCE ON THE CONSERV. OF ANTARCTIC MARINE LIVING RES., <http://www.ccamlr.org/en/organisation/convention-area>.

79. The Antarctic Treaty preamble, Dec. 1, 1959, 12 U.S.T. 794, available at <http://www.ats.aq/e/ats.htm>.

80. *Id.*

Parties (ATCP) for the protection and preservation of the environment of the Antarctic Treaty area.⁸¹ Additionally, those contracting parties agree to observe Antarctic Treaty conservation measures for the protection of the Antarctic environment.⁸² Contracting parties must further abide by the Protocol on Environmental Protection to the Antarctic Treaty and its annexes, and by other measures adopted by the ATCP relating to protecting the Antarctic environment from all harmful human interference.⁸³ The Protocol on Environmental Protection explicitly envisages, and indeed calls for, a system of protected areas, including marine ecosystems.⁸⁴ In 2002, ATCP and CCAMLR agreed that CCAMLR would take the lead on adopting a network of Southern Ocean MPAs.⁸⁵ The 2005 ATCP Decision 9, as well as a joint meeting between CCAMLR's Scientific Committee and the ATCP's Committee

81. Convention on the Conservation of Antarctic Marine Living Resources art. V, *supra* note 67, at 3476.

82. *Id.*

83. Article V, ¶ 2 provides that "the Contracting Parties which are not parties to the Antarctic Treaty will observe as and when appropriate the Agreed Measures for the Conservation of Antarctic Fauna and Flora *and such other measures* as have been recommended by the Antarctic Treaty Consultative Parties in fulfillment of their responsibility for the protection of the Antarctic environment from all forms of harmful human interference." CONVENTION ON THE CONSERV. OF ANTARCTIC MARINE LIVING RES. art. V, *supra* note 67, at 3476 (emphasis added).

84. Protocol on Environmental Protection to the Antarctic Treaty, Annex V, Art. 3.2 states that:

Parties shall seek to identify, within a systematic environmental-geographical framework, and to include in the series of Antarctic Specially Protected Areas:

- (a) areas kept inviolate from human interference so that future comparisons may be possible with localities that have been affected by human activities;
- (b) representative examples of major terrestrial, including glacial and aquatic, ecosystems and marine ecosystems;
- (c) areas with important or unusual assemblages of species, including major colonies of breeding native birds or mammals;
- (d) the type locality or only known habitat of any species;
- (e) areas of particular interest to ongoing or planned scientific research;
- (f) examples of outstanding geological, glaciological or geomorphological features;
- (g) areas of outstanding aesthetic and wilderness value;
- (h) sites or monuments of recognized historic value; and
- (i) such other areas as may be appropriate to protect the values set out in paragraph 1 above.

Protocol on Environmental Protection to the Antarctic Treaty Annex V, art. 3.2, Oct. 4, 1991, 30 I.L.M. 1455, available at <http://www.ats.aq/e/ep.htm>.

85. Antarctic Treaty Consultative Meeting, *Report of the Twenty-fifth Antarctic Treaty Consultative Meeting*, at [159], ATCM XXV (2002), available at http://www.ats.aq/documents/ATCM25/fr/ATCM25_fr002_e.pdf; COMM. FOR THE CONSERV. OF ANTARCTIC MARINE LIVING RES., REPORT OF THE XXI MEETING OF THE COMMISSION, at 12, 88, (2002), available at <https://www.ccamlr.org/en/CCAMLR-XXI>.

on Environmental Protection in 2009, further reinforced this agreement.⁸⁶

IV. MARINE PROTECTED AREAS AS A MANAGEMENT TOOL IN A CHANGING OCEAN

In their guidelines for RFMO best practices, Lodge et al. stipulate that managers should “[s]eek to ensure that the RFMO has the required resilience and flexibility to withstand the effects of unpredictable events on their fisheries, such as environmental shocks. The cooperative management agreements underpinning each RFMO should have built into them mechanisms for responding to such events.”⁸⁷ Climate change and the accompanying ocean acidification are resulting in dramatic shifts in species ranges and migration patterns, habitat availability, and other changes unprecedented in the history of our management.⁸⁸ In contemplating the future of marine management, we will need to pursue reforms that provide the speed and agility to address these dramatic changes at play in marine systems.⁸⁹

Managing marine areas under changing conditions posed by climate change is challenging, but MPAs, i.e., areas where human activities are limited or prohibited, have become an increasingly utilized conservation instrument in managing for the long-term health and sustainable use of our oceans.⁹⁰ Research suggests that

86. CEP/SC-CAMLR WORKSHOP, REPORT OF THE JOINT CEP/SC-CAMLR WORKSHOP 5-7 (2009), available at <http://bit.ly/1tlux7n>; COMM. ON ENVTL. PROT., FINAL REPORT OF THE TWENTY-EIGHTH ANTARCTIC TREATY CONSULTATIVE MEETING 369-70 (2005), available at http://www.ats.aq/documents/ATCM28/fr/ATCM28_fr002_e.pdf.

87. LODGE ET AL., *supra* note 40, at 117.

88. Scott C. Doney et al., *Climate Change Impacts on Marine Ecosystems*, 4 ANN. REV. MARINE SCI. 11 (2012); Simon Jennings & Keith Brander, *Predicting the Effects of Climate Change on Marine Communities and the Consequences for Fisheries*, 79 J. MARINE SYS. 418 (2010); Franklin B. Schwing et al., *Climate Change, Teleconnection Patterns, and Regional Processes Forcing Marine Populations in the Pacific*, 79 J. MARINE SYS. 245 (2010); Carol Turley, *Ocean Acidification*, in MANAGING OCEAN ENVIRONMENTS IN A CHANGING CLIMATE, 35, 35 (Kevin Noone et al. eds., 2013) (discussing impacts of ocean acidification on marine organisms and biodiversity).

89. Cf. Kathleen A. Miller et al., *Governing Marine Fisheries in a Changing Climate: A Game Theoretic Perspective*, 61 CAN. J. AGRIC. ECON. 309, 326 (2013) (discussing need for creativity and adaptability to achieve efficient governance of international fisheries in changing environmental conditions).

90. See, e.g., Sarah E. Lester et al., *Biological Effects Within No-Take Marine Reserves: A Global Synthesis*, 384 MARINE ECOLOGY PROGRESS SERIES 33, 37 (2009) (discussing study results showing that marine reserves increased biomass, species density, species size, and species richness); Jane Lubchenco et al., *Plugging a Hole in the Ocean: The Emerging Science of Marine Reserves*, 13 ECOLOGICAL APPLICATIONS (SUPPLEMENT) S3, S3-S4 (2003) (discussing

no-take MPAs, referred to as marine reserves, where fishing or other destructive or extractive activities are prohibited, provide a buffer by, e.g., protecting key ecosystem processes or safeguarding genetic diversity to build resilience to external stressors.⁹¹ Dynamic MPAs (where reserves move through space and time) and MPA networks can also protect important habitats such as spawning, breeding, feeding and nursery grounds, as well as migratory corridors, to allow species to survive and thrive despite changing conditions.⁹²

Most MPAs to date have been established in coastal rather than pelagic regions. Thus, most of the research demonstrating their success has been limited to coastal regions. Nonetheless, there are some models and studies that provide guidance on how to designate MPAs in regions of high uncertainty, or in the pelagic high seas. To be effective, especially in cases of high uncertainty or risk, MPAs and no-take marine reserves must be large enough to encompass and protect key ecological processes and the life history of the animals that live there.⁹³ The 1992 Convention on Biological Diversity (CBD) in 2009 adopted seven criteria for ecologically or biologically significant areas (EBSAs) as well as five additional criteria for MPA networks.⁹⁴ These criteria capture considerations such as rarity, threatened and endangered status, naturalness, representativeness, and areas characterized by critical life history stages of species; e.g., feeding and breeding grounds, migratory routes, larval sources, and

usefulness of marine reserves, a type of MPAs, in conservation and management); Callum M. Roberts et al., *The Role of Marine Reserves in Achieving Sustainable Fisheries*, 360 PHIL. TRANSACTIONS ROYAL SOC'Y 123, 128 (2005) (arguing for importance of marine reserves, a form of MPA, in conservation efforts).

91. See, e.g., Lester et al., *supra* note 90, at 37 (analyzing findings that no-take marine reserves increased biomass, species density, species size, and species richness); Lawrence J. McCook et al., *Adaptive Management of the Great Barrier Reef: A Globally Significant Demonstration of the Benefits of Networks of Marine Reserves*, 107 PROC. NAT'L ACAD. SCI. 18278, 18279 (2010) (discussing benefits to the Great Barrier Reef's ecosystem as a result of use of marine reserves).

92. See, e.g., Edward T. Game et al., *Dynamic Marine Protected Areas Can Improve the Resilience of Coral Reef Systems*, 12 ECOLOGY LETTERS 1336, 1342 (2009) (discussing the benefits of moving MPAs on biomass and resilience); McCook et al., *supra* note 91, at 18284 (describing positive ecological effects to Great Barrier Reef of an MPA network).

93. Steven D. Gaines et al., *Designing Marine Reserve Networks for Both Conservation and Fisheries Management*, 107 PROC. NAT'L ACAD. SCI. 18286, 18287 (2010) (detailing why a large enough reserve is needed for adequate protection).

94. Conference of the Parties to the Convention on Biological Diversity, Ninth Meeting, Bonn, Germany, May 19-30, 2008, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at Its Ninth Meeting: 20. Marine and Coastal Biodiversity*, UNEP/CBD/COP/DEC/IX/20, at Annex I-II (Oct. 9 2008).

other ecologically significant areas.⁹⁵ For highly migratory species, like bluefin tuna or loggerhead sea turtles, this might mean an MPA to protect their breeding grounds off Japan, or a dynamic MPA to protect their migration corridor within the North Pacific Transition Zone or within their prime feeding habitat within the California Current.⁹⁶ State-of-the-art habitat models integrate satellite-tracking data with remotely sensed oceanography to model the distribution and movements of species in relation to dynamic ocean features.⁹⁷ Dynamic MPAs that move with animal movements in and around oceanographic features could reduce bycatch for protected species while providing protection equivalent to large static closures.⁹⁸ MPA systems can include static reserves, a network of connected reserves, and dynamic closures. They should also include representative habitat types or oceanographic features. By including a range of features, MPA systems can provide a buffer against human-induced or natural disasters, including climate change,⁹⁹ and may be an essential component of management in a dynamic and changing environment. Large representative and comprehensive networks have already proven successful in social, economic, and environmental aspects in other large marine ecosystems, such as the Great Barrier Reef in Australia.¹⁰⁰ However, their establishment in marine areas beyond national jurisdiction (ABNJ), using the existing

95. See Kristina M. Gjerde & Anna Rulska-Domino, *Marine Protected Areas Beyond National Jurisdiction: Some Practical Perspectives for Moving Ahead*, 27 INT. J. MARINE & COASTAL L. 351, 359-60 (2012) (discussing the criteria).

96. See, e.g., Barbara A. Block et al., *Tracking Apex Marine Predator Movements in a Dynamic Ocean*, 475 NATURE 86, 90 (2011) (discussing migratory patterns of species such as bluefin tuna); S. Hoyt Peckham et al., *Demographic Implications of Alternative Foraging Strategies in Juvenile Loggerhead Turtles *Caretta caretta* of the North Pacific Ocean*, 425 MARINE ECOLOGY PROGRESS SERIES 269, 274 (2011) (studying migratory patterns of loggerhead sea turtles).

97. See, e.g., Sascha K. Hooker et al., *Making Protected Area Networks Effective for Marine Top Predators*, 13 ENDANGERED SPECIES RESEARCH 203, 209 (2011) (discussing models of migratory paths); Ramunas Zydulis et al., *Dynamic Habitat Models: Using Telemetry Data to Project Fisheries by Catch*, PROC. ROYAL SOC'Y B 3191, 3192 (2011) (using fishery tracking data to study albatross population).

98. See Edward T. Game et al., *Pelagic Protected Areas: The Missing Dimension in Ocean Conservation*, 24 TRENDS ECOLOGY & EVOLUTION, 360, 362-63 (2009) (discussing limitations of static MPAs).

99. Gjerde & Rulska-Domino, *supra* note 95, at 354 (mentioning use of MPAs to help address effects climate change); Kathy MacKinnon et al., *Natural Solutions: Protected Areas Helping People to Cope with Climate Change*, 45 ORYX 461, 461 (2011) (discussing how MPAs can help address effects of climate change).

100. McCook et al., *supra* note 91, at 12824 (detailing benefits of MPA networks in Great Barrier Reef).

framework of narrowly focused RFMOs, has been problematic, and could in the future face additional hurdles such as effective monitoring and enforcement.

V. THE CHALLENGE OF MPAS IN AREAS BEYOND NATIONAL JURISDICTION

In recognition of the role of MPAs in the conservation and management of the world's oceans, world leaders at the 2002 WSSD called for states to facilitate the establishment of a network of representative MPAs by 2012.¹⁰¹ States party to the 1992 Convention on Biological Diversity further noted this strategy in 2004¹⁰² and set a goal of protecting ten percent of the world's ecological regions by 2012.¹⁰³ In 2010, the international target for a network of MPAs was extended to 2020 by states party to the CBD as part of the Aichi Biodiversity Targets.¹⁰⁴ While this has proved perhaps most difficult to achieve in the high seas, three regional management organizations have succeeded so far in setting up MPAs in ABNJ.

The first was in 1999 when France, Monaco, and Italy established the Pelagos Sanctuary for Mediterranean Marine Mammals through a trilateral agreement.¹⁰⁵ This MPA was subsequently recognized as a Specially Protected Area of

101. World Summit on Sustainable Development, Johannesburg, South Africa, Aug. 26 – Sept. 24, 2002, *Plan of Implementation of the World Summit on Sustainable Development*, ¶ 32(c), U.N. Doc. A/CONF.199/20 (Sept. 4, 2002).

102. Conference of the Parties to the Convention on Biological Diversity, Seventh Meeting, Kuala Lumpur, Malaysia, Feb. 9-20, 27, 2004, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Seventh Meeting: 28. Protected Areas*, ¶ 18, UNEP/CBD/COP/DEC/VII/28 (April 13, 2004); Conference of the Parties to the Convention on Biological Diversity, Seventh Meeting, Kuala Lumpur, Malaysia, Feb. 9-20, 27, 2004, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Seventh Meeting: 5. Marine and Coastal Biodiversity*, ¶¶ 18–31, UNEP/CBD/COP/DEC/VII/5 (Apr. 13, 2004).

103. Conference of the Parties to the Convention on Biological Diversity, Seventh Meeting, Kuala Lumpur, Malaysia, Feb. 9-20, 27, 2004, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Seventh Meeting: 30. Strategic Plan: Future Evaluation of Progress*, Annex II, UNEP/CBD/COP/DEC/VII/30 (Apr. 13, 2004).

104. Conference of the Parties to the Convention on Biological Diversity, Tenth Meeting, Nagoya, Japan, Oct. 18-29, 2010, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Tenth Meeting: 2. Strategic Plan for Biodiversity 2011-2020*, Annex, UNEP/CBD/COP/DEC/X/2 (Oct. 29, 2010). Aichi Target 11 calls for 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, to be conserved through effectively and equitably managed, ecologically connected and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into wider landscapes and seascapes.

105. Giuseppe Notarbartolo di-Sciara et al., *The Pelagos Sanctuary for Mediterranean Marine Mammals*, 18 AQUATIC CONSERVATION: MARINE & FRESHWATER ECOSYSTEMS 367, 367 (2008) (discussing history of Pelagos Sanctuary).

Mediterranean Importance under the Barcelona Convention's 1995 Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean. Fifty-three percent of the MPA falls within the high seas. However, the situation of the Mediterranean Sea is unique, as "any waters beyond the limits of national jurisdiction (high seas) would disappear if all the coastal states decided to establish their own exclusive economic zones (EEZ)."¹⁰⁶

The first fully high seas MPA was designated south of the sub-Antarctic South Orkney Islands in 2009 by CCAMLR. Designated as a no-take zone explicitly closed to fishing, the South Orkney Islands Southern Shelf MPA set aside about 94,000 km² of the Southern Ocean as a marine reserve.¹⁰⁷ Further, in 2011, CCAMLR adopted a conservation measure that established an explicit framework for establishing CCAMLR MPAs.¹⁰⁸ The framework set up guidelines for protecting representative marine ecosystems, biodiversity and habitats, including key ecosystem processes and species as well as vulnerable, unique or rare habitats and features.¹⁰⁹ The CCAMLR 2011 framework also required establishing reference areas to measure the effects of fishing and climate change.¹¹⁰ It stated that MPAs should be developed based on the best available science and in accordance with Article II of the CAMLR Convention, which defines conservation to include "rational use."¹¹¹ Thus far, CCAMLR has identified nine planning domains within the convention area, and various member states have taken the lead on developing MPA proposals based on their historical involvement in these areas.¹¹² Since 2011, three MPA proposals—in the Ross Sea, East Antarctic, and for the areas under ice shelves—

106. T. SCOVAZZI, NOTE ON THE ESTABLISHMENT OF MARINE PROTECTED AREAS BEYOND NATIONAL JURISDICTION OR IN AREAS WHERE THE LIMITS OF NATIONAL SOVEREIGNTY OR JURISDICTION HAVE NOT YET BEEN DEFINED IN THE MEDITERRANEAN SEA at 8 (UNEP Regional Activity Center for Specially Protected Areas, ed., 2011).

107. COMM. FOR THE CONSERV. OF ANTARCTIC MARINE LIVING RES., CONSERVATION MEASURE 91-03: PROTECTION OF THE SOUTH ORKNEY ISLANDS SOUTHERN SHELF, CCAMLR-XXVII (2009).

108. COMM. FOR THE CONSERV. OF ANTARCTIC MARINE LIVING RES., CONSERVATION MEASURE 91-04: GENERAL FRAMEWORK FOR THE ESTABLISHMENT OF CCAMLR PROTECTED AREAS, CCAMLR-XXX (2011).

109. *Id.*

110. *Id.*

111. COMM. FOR THE CONSERV. OF ANTARCTIC MARINE LIVING RES., art. II, ¶ 2, May 20, 1980. 33 U.S.T. 3476. Under CAMLR Convention Art. II.2, 'rational use' allows for scientific and commercial harvesting of living resources as long as activities do not cause changes in the exploited and dependent populations, or significant adverse effects on the ecosystems of which they are part that are not reversible in 20-30 years.

112. See Brooks, *supra* note 73.

have been developed but none have yet been adopted due to a lack of consensus.¹¹³ The 2009 South Orkney Islands Southern Shelf MPA faced little resistance, but did not interfere with current fishing, and an area that might have been of interest in a future fishery was further excluded.¹¹⁴ CCAMLR held a special intercessional meeting in July 2013, only the second in the history of the Commission.¹¹⁵ The special meeting aimed to progress a Ross Sea and East Antarctic MPA. Nevertheless, CCAMLR still failed to reach consensus on any of the MPAs, reflecting the vocal opposition of a small minority of its members.¹¹⁶ Though phrased as questions regarding the legitimacy, management details, and duration of the proposed MPAs, the driving interest of the small minority was perceived by most observers as a desire not to foreclose future fishing opportunities.¹¹⁷ In other words, those intent on the “right to fish” anywhere and at any time prevailed over those intent on safeguarding marine ecosystems.

In 2010, the first “network” of high seas MPAs was established in the Northeast Atlantic by the Commission to the Convention for the Protection of the Marine Environment of the Northeast Atlantic (Oslo and Paris Conventions, or OSPAR).¹¹⁸ The OSPAR Commission is comprised of fifteen European states together with the European Union.¹¹⁹ During ministerial statements at Sintra, Portugal in 1998, Bremen, Germany in 2003, and Bergen, Norway in 2010, states agreed that the OSPAR Commission would promote the establishment of an ecologically coherent network of well-managed marine protected areas.¹²⁰ In 2010, OSPAR declared six marine protected areas comprising 287,070 km² of the Northeast Atlantic,¹²¹ established on the basis of legally-binding OSPAR

113. *Id.*

114. *Id.* at 277.

115. *Id.*

116. *Id.*

117. *Id.*

118. Bethan C. O’Leary et al., *The First Network of Marine Protected Areas (MPAs) in the High Seas: The Process, the Challenges and Where Next*, 36 *MARINE POL’Y* 598 (2012).

119. The full list of contracting parties includes: Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the European Union.

120. Jeff A. Ardron, *The Challenge of Assessing Whether the OSPAR Network of Marine Protected Areas is Ecologically Coherent*, 606(1) *HYDROBIOLOGICA* 45 (2008).

121. See B.C. O’Leary et al., *The First Network of Marine Protected Areas (MPAs) in the High Seas: The Process, the Challenges and Where Next*, 36 *MARINE POL’Y* 598, 598 (2012) (discussing OSPAR decision in 2010).

Decisions under Annex V to the OSPAR Convention¹²² and in accordance with Recommendation 2003/3.¹²³ A seventh area extending the network—the Charlie-Gibbs North High Seas MPA—was designated in 2012 expanding the OSPAR protected area coverage to 465,164 km².¹²⁴ OSPAR contracting parties have nominated three additional MPA sites that are in areas subject to submission by contracting parties to the United Nations Commission on the Limits of the Continental Shelf for an extended continental shelf.¹²⁵

The 1992 OSPAR Convention regulates most human activities that can adversely affect the marine environment with the notable exceptions of shipping and fisheries.¹²⁶ Possible negative impacts from fisheries need be brought to the attention of the competent RFMO for the region, the North-East Atlantic Fisheries Commission (NEAFC).¹²⁷ In a parallel process in 2009, NEAFC established areas closed to bottom trawl fisheries that largely, but not wholly, correspond with the MPAs proposed within OSPAR at that time.¹²⁸ Cooperation between the OSPAR Commission and NEAFC is guided by a memorandum of understanding and mainly takes place through exchange of information at the Secretariat level.¹²⁹ In addition both organizations have embarked on a process to develop a so-called “Collective Arrangement” on the management of selected areas in the northeast Atlantic. Although not a legally binding instrument, the Collective Arrangement seeks to foster

122. Convention for the Protection of the Marine Environment of the North-East Atlantic Annex V, Sept. 22, 1992, 2354 U.N.T.S. 67.

123. Meeting of the OSPAR Commission, June 23-27, 2003, Bremen, Germany, *Recommendation 2003/3 on a Network of Marine Protected Areas*, OSPAR 03/17/1-E, Annex 9 (June 27, 2003).

124. THE CONVENTION FOR THE PROT. OF THE MARINE ENV'T OF THE NE. ATL., 2012 STATUS REPORT ON THE OSPAR NETWORK OF MARINE PROTECTED AREAS (2013), available at http://www.ospar.org/documents/dbase/publications/p00618/p00618_2012_mpa_status%20report.pdf.

125. *Id.* at Table 1.

126. Shipping is regulated by the International Maritime Organization.

127. THE CONVENTION FOR THE PROT. OF THE MARINE ENV'T OF THE NE. ATL., ANNEX V: ON THE PROTECTION AND CONSERVATION OF THE ECOSYSTEMS AND BIOLOGICAL DIVERSITY OF THE MARITIME AREA at Art. 4 (1992), available at http://www.ospar.org/html_documents/ospar/html/ospar_convention_e_updated_text_2007_annex_v.pdf.

128. See generally Ingrid Kvalvik, Managing Institutional Overlap in the Protection of Marine Ecosystem on the High Seas: The Case of the North East Atlantic, 56 OCEAN & COASTAL MGMT. 35 (2011).

129. Memorandum of Understanding Between the North East Atlantic Fisheries Commission (NEAFC) and the OSPAR Commission, Sept. 5, 2008, available at http://www.ospar.org/html_documents/ospar/html/mou_neafc_ospar.pdf.

commitment to cooperate and to coordinate information exchange in the development and implementation of appropriate measures for the conservation and management of certain areas that would be selected by the different organizations.¹³⁰ The Collective Arrangement is open to all relevant sectoral management bodies; however, so far only the OSPAR Commission has endorsed the Collective Arrangement.¹³¹

Despite the success of OSPAR in adopting this network of MPAs, ongoing work to describe EBSAs in this region per CBD decisions¹³² has been slowed by NEAFC's requests for external reviews, and by concerns from some contracting parties about the overlaps with outer continental shelf areas that have been submitted to the UN Commission on the Limits of the Continental Shelf. These differences in approach regarding EBSAs reflect the difference more generally between regional fisheries bodies and regional seas agreements, the former of which is primarily concerned with fishing, whereas the latter considers a wider range of ocean ecosystem issues. The success of existing and future MPAs relies on reconciling the underlying differences in the priorities placed on marine ecosystems, including health, resilience, and biodiversity. Also implicated are the optimum sustainable yield of fish stocks and the current imbalance of power between organizations focused on conservation (e.g., OSPAR) and RFMOs (e.g., NEAFC).¹³³

130. David E. Johnson, *Can Competent Authorities Cooperate for the Common Good: Towards a Collective Arrangement in the North-East Atlantic*, in ENVIRONMENTAL SECURITY IN THE ARCTIC OCEAN 333 (Paul A. Berkman & Alexander N. Vylegzhanin eds., 2013).

131. David Freestone et al., *Can Existing Institutions Protect Biodiversity in Areas Beyond National Jurisdiction? Experiences from Two On-Going Processes*, 42 MARINE POL'Y (forthcoming 2013); Julien Rochette et al., *The Regional Approach to the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction*, MARINE POL'Y (forthcoming 2014); THE CONVENTION FOR THE PROT. OF THE MARINE ENV'T OF THE NE. ATL., MEETING OF THE OSPAR COMMISSION: SUMMARY RECORD at § 4.17 (June 20-24, 2011), http://www.eba.eu.com/site-documents/environmental-docs/ospar/OSPAR11_sr-e.pdf.

132. Conference of the Parties to the Convention on Biological Diversity, Ninth Meeting, Bonn, Germany, May 19-30, 2008, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Ninth Meeting: 20. Marine and Coastal Biodiversity*, UNEP/CBD/COP/DEC/IX/20 (Oct. 9, 2008); Conference of the Parties to the Convention on Biological Diversity, Tenth Meeting, Nagoya, Japan, Oct. 18-29, 2010, *Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Tenth Meeting: 29. Marine and Coastal Biodiversity*, UNEP/CBD/COP/DEC/X/29 (Oct. 29, 2010).

133. OSPAR/NEAFC SPECIAL REQUEST ON REVIEW OF THE RESULTS OF THE JOINT OSPAR/NEAFC/CBD WORKSHOP ON ECOLOGICALLY AND BIOLOGICALLY SIGNIFICANT AREAS (EBSAs) (2013), available at <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/Special%20requests/OSPAR-NEAFC%20EBSA%20review.pdf>.

Progress establishing MPAs in the three regions discussed above, while commendable, has been plagued by difficulties. These include: 1) the absence of globally agreed-upon criteria, principles, and procedures for establishing MPAs; 2) the lack of a mandate (or priority) for biodiversity conservation in sectoral organizations such as RFMOs; and 3) the lack of coordination mechanisms between existing sectoral and regional instruments; and 4) the lack of an international legal instrument to establish a binding legal obligation to cooperate in the establishment of a global system of ecologically representative and effectively managed MPAs.¹³⁴ The failure of the current CCAMLR MPA proposals to gain acceptance also illustrates the unwillingness of some states to forgo fishing opportunities, even potential future opportunities in currently unfished areas.¹³⁵ To provide a legal mandate to protect biodiversity in areas beyond national jurisdiction, many states, scientists and non-governmental organizations have been calling for a new international instrument—in particular, a new implementing agreement under UNCLOS on the conservation and sustainable use of marine biodiversity beyond national jurisdiction.¹³⁶

To discuss rising concerns over threats to marine biodiversity beyond national jurisdiction, in 2004 the United Nations General Assembly established a special (ad hoc informal) Working Group. This UN Working Group has met seven times since 2006, initially making very slow progress. In 2011, states agreed to a so-called “package deal” wherein issues of greatest interest to many developing countries—including benefit sharing of marine genetic resources derived from areas beyond national jurisdiction, capacity building and transfer of marine technology—would be addressed alongside conservation tools such as MPAs and environmental impact assessments.¹³⁷ As a result of this combined approach, many more states started to support the calls for a new implementing agreement under UNCLOS to address these issues. At the United Nations Conference on Sustainable Development in Rio de Janeiro in June 2012, most states were ready to call for the

134. Kristina M. Gjerde, Challenges to Protecting the Marine Environment Beyond National Jurisdiction, 27 INT'L J. MARINE & COASTAL L. 839, 846-47 (2012).

135. See Brooks, *supra* note 73.

136. Elisabeth Druel & Kristina Gjerde, *Sustaining Marine Life Beyond Boundaries: Options for an Implementing Agreement for Marine Biodiversity Beyond National Jurisdiction Under the United Nations Convention on the Law of the Sea*, 42 MARINE POL'Y at 2 (forthcoming 2013), available at <http://dx.doi.org/10.10.16/j.marpol.2013.11.023>.

137. *Id.*

immediate launch of negotiations for a new international agreement that could address, inter alia, the package of issues identified by the UN Working Group. In other words, area based management tools, including MPAs, environmental impact assessments, benefit sharing of marine genetic resources, technology transfer, and capacity building.¹³⁸ However, due to the objections of a few, it was instead agreed that a decision on whether to launch negotiations for a new legal agreement would be made no later than August 2015.¹³⁹ In follow-up to this commitment, the UN Working Group in 2013 agreed to consider the “scope, parameters and feasibility” of such an instrument through a series of at least three meetings before the deadline of August 2015.¹⁴⁰

A new implementing agreement under UNCLOS, could set an internationally agreed process for the establishment of high seas MPA networks and standards for RFMOs and other international competent organizations performance with respect to biodiversity conservation. It could establish the basis for a universally applicable legal regime based on precaution, ecosystem-based management, and transparent, science-based decision-making. It could allow for an explicit mandate for all states party and international organizations to cooperate in safeguarding high seas biodiversity through MPAs, environmental impact assessments, and other tools while addressing equitable concerns with respect to benefit sharing, technology transfer and capacity development.¹⁴¹ In short, such an agreement would enable states to fulfill their commitment at Rio+20 to “protect, and restore, the health, productivity and resilience of oceans and marine ecosystems, and to maintain their biodiversity, enabling their conservation and sustainable use for present and future generations.”¹⁴² And it could provide the means to ensure that all states and competent international organizations, including RFMOs, incorporate mechanisms to “effectively apply an ecosystem approach and the precautionary approach in the management, in accordance with international law, of activities impacting on the marine environment, to deliver on all three dimensions of

138. G.A. Res. 66/288, ¶ 162, U.N. Doc. A/RES/66/288 (September 11, 2012), available at http://www.un.org/en/ga/search/view_doc.asp?symbol=%20A/RES/66/288.

139. *Id.*

140. U.N. GAOR, 66th Sess., Letter Dated 23 September 2013 from the Co-Chairs of the Ad Hoc Open-Ended Informal Working Group to the President of the General Assembly, U.N. Doc. A/68/399 (Sept. 23, 2013), available at http://www.un.org/Depts/los/reference_files/new_developments_and_recent_adds.htm.

141. Druel & Gjerde, *supra* note 136, at 4.

142. United Nations General Assembly, *supra* note 138, at ¶ 158.

sustainable development.”¹⁴³ While this new international agreement is not a substitute or a replacement for the need to reform existing organizations or to make better use of existing instruments, a new international instrument could significantly accelerate such improvements. As was seen in the case of deep sea bottom fishing on the high seas (discussed above), common goals, priorities and global accountability for progress can be an effective stimulus for progress. With their underpinning and the backing of a new global legal instrument, a more comprehensive global approach to ocean governance would be possible.¹⁴⁴

VI. RFMO REFORM FOR MANAGING A DYNAMIC OCEAN

RFMOs face considerable challenges in managing marine living resources, given the ocean’s dynamic processes and the globalized context of the twenty-first century, which only serve to complicate those difficulties. However, despite these challenges, some groups of actors such as CCAMLR have been able to implement measures that serve as an example of how we might govern high seas resources in a more responsive and sustainable way. If these approaches are to be duplicated by other RFMOs, and expanded to cover more of the world’s oceans, it would be illuminating to review the institutional characteristics that might facilitate RFMOs in meeting the conservation and ecosystem-based management directives of the UN agreements.

One characteristic essential to consider is that of the RFMO’s composition—the parties, members, observers, and lobbyists who convene around the issues subject to the RFMO. If an organization has a biased set of participants (e.g., being comprised only of users), then the outcome is likely to reflect that bias (e.g., increased harvest levels). As stated before, one reason for CCAMLR’s success in passing more ecosystem-based and conservation measures is that it is comprised of both fishing and non-fishing science-focused members. Therefore one institutional characteristic that may prove essential in effectively and sustainably managing marine living resources is that of a stakeholder base that extends beyond those exploiting the resource. In this regard, transparency and access to non-fisheries dependent data is important as lack of effective access to information can limit the ability to peer-review the scientific

143. *Id.*

144. Rochette et al., *supra* note 131; Druel & Gjerde, *supra* note 136, at 7.

advice, participate in rulemaking, and track compliance.¹⁴⁵ Accordingly, the continued expansion of open-access ocean biological data such as the Ocean Biogeographic Information System¹⁴⁶ will also be essential to support ecosystem-based decision-making in RFMOs and other regional entities.¹⁴⁷

Thus, to balance the interests inside RFMOs, participation from non-fishing states, various sectors, independent scientists and non-governmental conservation organizations could be intentionally increased in a targeted way to reflect the interests of the international community with regard to sustainable fisheries and protection of marine biodiversity.¹⁴⁸ A regular global level review of state and RFMO performance, as was developed with respect to deep-sea bottom fishing, may be another essential component to ensure consistent and coherent performance and the representation of interests across all ocean basins.¹⁴⁹

A second institutional quality that may facilitate the ability of a RFMO to manage resources more dynamically, i.e., responding to spatial and temporal changes,¹⁵⁰ is a formal ecosystem-based mandate. In contrast to the five tuna RFMOs,¹⁵¹ which are charged with managing tuna, tuna-like, and associated species in huge swaths of national and international waters, CCAMLR is responsible for governing “all species of living organisms . . . found south of the Antarctic Convergence” and prioritizes conservation of ecological relationships as well as the ecosystem itself.¹⁵² While some RFMOs approximate ecosystem-based language by calling for conservation

145. Ardron et al., *Tracking 24 Years of Discussions About Transparency in International Marine Governance: Where Do We Stand?*, 33 STAN. ENVTL. L.J. 167 (2014), available at <https://journals.law.stanford.edu/stanford-environmental-law-journal-elj/print/volume-33/number-2/tracking-24-years-discussions-about-transparency-international-marine>.

146. OCEAN BIOGRAPHIC INFORMATION SYSTEM, <http://www.iobis.org/> (last visited May 2, 2014).

147. See generally Ban et al., *supra* note 35; Daniel C. Dunn et al., *The Convention on Biological Diversity's Ecologically or Biologically Significant Areas: Origins, Development, and Current Status*, 43 MARINE POL'Y (forthcoming 2014), available at http://sites.duke.edu/dcdunn/files/2014/02/Dunn_Ardron_et_al_2014.pdf.

148. Gjerde et al., *supra* note 40, at 544.

149. *Id.* at 547.

150. See Alistair Hobday et al., *Dynamic Ocean Management: Integrating Scientific and Technological Capacity with Law, Policy and Management*, 33 STAN. ENVTL. L.J. 125 (2014) (defining this type of response).

151. *Viz.* the Inter-American Tropical Tuna Commission, the Indian Ocean Tuna Commission, the Western and Central Pacific Fisheries Commission, the International Commission for the Conservation of Atlantic Tunas, and the Commission for the Conservation of Southern Bluefin Tuna.

152. COMM. FOR THE CONSERV. OF ANTARCTIC MARINE LIVING RES., CAMLR CONVENTION Art. 1.2, 2.3, available at <http://www.ccamlr.org/en/organisation/camlr-convention-text>.

of target species as well as those dependent upon them, a number have still not updated their constituent treaties to incorporate the requirements of the 1995 UNFSA.¹⁵³ Ecosystem-based management is difficult to address in a single-species regime. Terms like “ecosystem-based management,” “protecting biodiversity,” and other associated ideas are often not defined in RFMO conventions except in a vague (and potentially easily ignored) way, and there is no global level accountability for poor state or RFMO performance on behalf of marine species or ecosystems. A natural reform would be to redefine the mandate from being species-specific (e.g., tuna) to ecosystem-specific (e.g., pelagic resources or ocean regions). To accomplish this, it may be necessary to expand investment beyond single-species management, find ways to manage holistically between states with varying interests, and expand the pool of expertise to include ecologists and conservation scientists.

A third characteristic that may better enable RFMOs to manage effectively and nimbly is heightened capacity for compliance monitoring.¹⁵⁴ RFMOs have thus far largely been unsuccessful in effectively enforcing policies and regulations against their own member states,¹⁵⁵ and are subject to the same constraints as all regional and international bodies in negotiating the subtleties of state sovereignty. However, a few possible reforms are worth consideration in increasing RFMOs abilities to effectively govern fishing states and their vessels. Within individual RFMOs, state members could be subject to evaluation on modern conservation standards and criteria, with regular reviews and independent audits accompanied by appropriate incentives to stimulate improvement (e.g., sanctions or assistance).¹⁵⁶ Again, a global regular review process could help to stimulate consistent and steady improvements. A further step in the right direction would be to consider establishing a reverse burden of proof similar to CCAMLR, whereby fishing and other extractive activities are not permitted unless and until precautionary, ecosystem-based conservation and

153. E.g., ICCAT, IOTC and IATTC. Note, however, the example of the parties to NEAFC, which—in a groundbreaking decision—incorporated these concerns retrospectively. At the 24th meeting of the NEAFC parties in 2005 they approved a Declaration on the Interpretation and Implementation of the Convention on the Future Multilateral Cooperation in North-East Atlantic Fisheries, agreeing to incorporate the post-UNCED global agreements and instruments into their own regime. See Freestone, *supra* note 37.

154. See Hobday et al., *supra* note 150.

155. See Gjerde et al., *supra* note 40; Lodge et al., *supra* note 40.

156. See Gjerde et al., *supra* note 40.

management measures have been agreed and implemented. Such a provision might have prevented the serial depletion and habitat destruction caused by decades of unregulated deep-sea bottom fishing in the high seas.¹⁵⁷

A fourth essential characteristic is constraining the operating principle of consensus. Many RFMOs are hindered in the creation and revision of their policies and regulations by their need to achieve consensus.¹⁵⁸ While consensus has its merits, as it enables the equal voice of both powerful and non-powerful members, it is oftentimes used to hamstringing the regulatory process and render any movements toward conservation impotent.¹⁵⁹ The reliance on consensus is particularly problematic when dealing with issues of reducing allocations, closing areas to fishing, or identifying and punishing non-compliant RFMO member states, as these states would need to agree to their own reduced access or punishment. While a consensus-based approach may be appropriate for the adoption of some rules and regulations, a reconsideration of the consensus method would seem to be appropriate for conservation, compliance, and enforcement measures. This could come in the form of adopting rules when agreed upon by a "sufficient consensus," moving towards a "tacit consent" procedures, or straight majority thresholds. External review or mediation procedures, written justification for objections, and implementing independent compliance committees not directly made up of member states are also worth further consideration.

Another possible reform could be to create a common cross-sectoral mandate for ecosystem-based management and cooperation as part of a new implementing agreement under UNCLOS. Such an agreement could specifically incorporate the CBD Aichi Target 11 for the development of a well-connected, ecologically representative, effectively managed network of MPAs comprising at least 10% of the marine environment in ABNJ.¹⁶⁰ This

157. See Kristina M. Gjerde & David Freestone, Editors' Introduction, *Unfinished Business: Deep-Sea Fisheries and the Conservation of Marine Biodiversity Beyond National Jurisdiction*, 19 INT'L J. MARINE & COASTAL L. 209, 212-14 (2004).

158. See David Freestone, *Fisheries, Commissions and Organizations*, MAX PLANCK ENCYCLOPEDIA PUB. INT'L L. Dec. 2010, ¶ 16, available at <http://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e1161?rskey=KqIFXz&result=1&prd=EPIL>.

159. See Brooks, *supra* note 73 (discussing the blocking of adoption of CCAMLR MPAs at the Intercessional Meeting in July 2013).

160. Conference of the Parties to the Convention on Biological Diversity, *supra* note 104.

could serve to rebalance the interplay between global and regional responsibilities by providing a common goal, target, and objectives to strive for. Such cooperation could be a precursor for the creation of new regional oceans management organizations tasked with managing ecosystems, not populations, that would be inclusive of all the different aspects that are needed (e.g. all fisheries, pollution issues, shipping, mineral and oil exploitation, et cetera). As with CCAMLR, such regional institutions could be generated with ecosystem conservation as a focus, while enabling rational use that is consistent with that overarching goal.¹⁶¹ At the same time, existing (reformed) sectoral bodies could continue to gather data and allocate fish stocks, or regulate shipping or seabed mining on a global basis.

RFMOs face a tremendous number of challenges in their efforts to manage the marine living resources of shared stocks in the high seas, in a context of a changing ocean, and may be constrained by their own structure to achieve the goals they were created for. As explained above, changes in organizational composition, mandate, compliance mechanisms, and participant buy-in represent some of the potential institutional reforms that may facilitate the ability of RFMOs to manage for a changing ocean. An ambitious UNCLOS implementing agreement could be a vehicle for pursuing many of the reforms described above.¹⁶²

VII. REFRAMING THE RIGHT TO FISH

Grotius' assertion that the riches of the sea are a common property resource free for all mankind has been misinterpreted by some as an unfettered "right to fish," and this interpretation continues to pervade our collective consciousness. But like any historical document, it is imperative to understand both the intention and the context of "Mare Liberum." Grotius' concept was formulated in a time when cod and herring were inexhaustible with respect to the fishing power and the demand for fish of all nations combined. When there are truly enough fish for all, open access to high seas fish stocks may be an understandable and appropriate corollary to the "Freedom of the Seas," as it would serve the common good. But the situation has changed, and the "great sea

161. *Id.*; see also Ardron et al., *supra* note 145.

162. Gjerde et al., *supra* note 40 at 548; see also Druel & Gjerde, *supra* note 136.

fisheries” have proven to be woefully exhaustible.¹⁶³ Thus, if the fish in the high seas belong to “no private man,” as Grotius asserted, they must belong to everyone. Therefore, the high seas fish stocks should be viewed a common property resource, intended to benefit all people and not just the few.

With global declines well documented for many fish stocks,¹⁶⁴ and the challenges of a fast-changing ocean compounding the pressures on depleted ecosystems, states will need to recognize the clear indications that the “right to fish” no longer serves the common good. Rather, high seas fisheries should be managed as part of a global ocean public trust in the interests of present and future generations.¹⁶⁵ Further, if high seas resources are intended to benefit all people, a closer look at the economics of fisheries reveals a tremendous disparity in the wealth derived from high seas resources between rich and poor nations. The top ten countries that fish in the high seas are estimated to appropriate over 70% of the total catch value to themselves.¹⁶⁶ Even further, if we extend our definition of “all people” to include generational equity, our current resource management is on a course to fail miserably in the equitable distribution of wealth across time. Instead of living off the interest of our global trust, we have eaten our way through most of the capital.¹⁶⁷

RFMOs, while slowly improving their practices, are nevertheless failing to achieve their central objectives. Even CCAMLR—arguably the “RFMO” with the strongest mandate to conserve, and one of the best track records—is mired in the sluggishness of strict consensus decision-making and thus also failing, so far, to make the changes necessary to ensure the future health of the Southern Ocean. In recent years, CCAMLR has

163. See, e.g., Ransom A. Myers & Boris Worm, *Rapid Worldwide Depletion of Predatory Fish Communities*, 423 NATURE 280, 280-83 (2003); Swartz et al., *supra* note 62; Morato et al., *supra* note 62.

164. Boris Worm et al., *Impacts of Biodiversity Loss on Ocean Ecosystem Services*, 314 SCIENCE 787, 787-90 (2006).

165. See Mary Turnipseed et al., *Using the Public Trust Doctrine to Achieve Ocean Stewardship*, in RULE OF LAW FOR NATURE: NEW DIMENSIONS AND IDEAS IN ENVIRONMENTAL LAW 365, 365-379 (Christina Voigt ed., 2013) (analyzing the applicability of the Public Trust Doctrine to marine areas beyond national jurisdiction).

166. U. Rashid Sumaila et al., *Fisheries Subsidies and Potential Catch Loss in SIDS Exclusive Economic Zones: Food Security Implications*, 18(4) ENV'T & DEV. ECON. 427, 429 (2013).

167. See Myers & Worm, *supra* note 164; Elliott A. Norse et al., *Sustainability of Deep-Sea Fisheries*, 36 MARINE POL'Y 307, 307-20 (2012) (demonstrating rapidly declining catch rates during fishery development).

struggled in meeting its own conservation mandates and in staying true to the original values of the Antarctic Treaty. Climate change has already had a tremendous impact on the Antarctic, particularly the Western Antarctic Peninsula, which has experienced a 2.8°C rise in temperature between 1950 and 2005, the most rapid rise in annual observed temperature anywhere on the planet.¹⁶⁸ Further, ~87% of glaciers around the Antarctic Peninsula have retreated in recent decades.¹⁶⁹ CCAMLR recognizes “that global climate change is one of the greatest challenges facing the Southern Ocean,”¹⁷⁰ and further maintains an agenda item to discuss climate change at its annual meeting. Yet, the adoption of meaningful measures to better understand and respond to a changing climate has yet to be seen. An Ice Shelves MPA specifically directed at facilitating the study of ecosystem processes under climatic change in the Antarctic Peninsula was presented to the Commission in 2012.¹⁷¹ While the Scientific Committee considered the MPA to be of major scientific and conservation value,¹⁷² the Commission could not reach consensus on the MPA, nor two others proposed that year—both of which contained notable climate change reference areas.¹⁷³

But RFMOs are not fully to blame; they have been set up, to some extent, to fail. UNCLOS mandates that RFMOs maintain harvested species at maximum sustainable yield (MSY) levels,¹⁷⁴ despite growing awareness that this management strategy is fraught with problems, including that it ignores ecosystem considerations, such as related and dependent species.¹⁷⁵ This preeminence of the principles of MSY and of optimum utilization of living resources in

168. John Turner et al., *Antarctic Climate Change During the Last 50 Years*, 25 INT. J. CLIMATOLOGY 279 (2005).

169. A.J. Cook et al., *Retreating Glacier Fronts on the Antarctic Peninsula over the Past Half-Century*, 308 SCIENCE 541, 541-42 (2005); Turner et al., *Antarctic Climate Change and the Environment: An Update*, POLAR REC. (April 18, 2013), available at <http://www.scar.org/publications/occasionals/acce.html>.

170. COMM. FOR THE CONSERV. OF ANTARCTIC MARINE LIVING RES., RESOLUTION 30/XXVII: CLIMATE CHANGE (2009), available at <http://www.ccamlr.org/en/resolution-30/xxviii-2009>.

171. SCIENTIFIC COMM. FOR THE CONSERV. OF ANTARCTIC MARINE LIVING RES., REPORT OF THE XXX MEETING OF THE SCIENTIFIC COMMITTEE, ¶ 5.67 (Oct. 24-28, 2011).

172. *Id.* at ¶¶ 5.76-5.77.

173. See Brooks, *supra* note 73.

174. 1833 U.N.T.S. 3, art. 61(3).

175. See generally RAYMOND J.H. BEVERTON & SIDNEY J. HOLT, ON THE DYNAMICS OF EXPLOITED FISH POPULATIONS (1957); CARMEL FINLEY, ALL THE FISH IN THE SEA: MAXIMUM SUSTAINABLE YIELD AND THE FAILURE OF FISHERIES MANAGEMENT (Univ. of Chicago Press 2011); Ellen Hey, *The Persistence of a Concept: Maximum Sustainable Yield*, in THE 1982 LAW OF THE SEA CONVENTION AT 30 (David Freestone ed., 2013).

the EEZ is also reflected in the UNCLOS provision—where a coastal state does not have the capacity to harvest its entire allowable catch, then it shall give access to other states.¹⁷⁶ The “right to fish” is infused even in our most comprehensive mandates for conservation. The contradictory mandates under UNCLOS—to maintain MSY, but with the obligation of protecting and preserving the environment—need to be reconciled.

Under present conditions, the maze of international law needs to be reformed to address the critical need for conservation in a fast-changing ocean. States will need to reinterpret the “Freedom of the Seas” to assert the right of present and future generations to have fish in the sea and to underscore the duty to protect biodiversity in the marine environment. As under CCAMLR, perhaps fishing should only be allowed under precautionary and ecosystem-based regulations. In essence, high seas fishing should be a privilege, not a right and should flow only to those able to demonstrate regional cooperation, transparency, reporting, and compliance.

Until an effective regime is in place, whether through RFMO reform or the initiation of regional oceans management organizations and/or a unified high seas management body, one possible—if idealistic—solution is to close the high seas to extractive fishing activities as a precautionary measure.¹⁷⁷ As argued in Sumaila et al.,¹⁷⁸ closing the high seas to fishing activities would almost surely result in ecological, economic and social benefits to the global community—a win-win-win situation for all. First, the fragile deep and high seas habitats and the slow growing fish species they support would be protected. Second, the high seas would serve as a fish bank¹⁷⁹ and an insurance policy to protect us from “true uncertainty.”¹⁸⁰ Third, since only a very small amount of fish is currently caught solely in the high seas (i.e., discrete high seas fish stocks), protecting all of the high seas could result in more catch and catch value globally through the net straddling of fish from the high

176. 1833 U.N.T.S. 3, art. 62.

177. Sumaila et al., *supra* note 166 (arguing that it may well be economically, socially and morally sensible for the high seas to be completely closed to fishing); Crow White & Christopher Costello, *Close the High Seas to Fishing?*, 12 PLOS BIO. Mar. 25, 2014 (finding that completely closing the high seas to fishing would simultaneously give rise to greater than 100% gains in fisheries profit, greater than 30% gains fisheries yields, and greater than 150% gains to fish stock conservation).

178. Sumaila et al., *supra* note 166; *see also* White & Costello, *supra* note 177.

179. Sumaila et al., *supra* note 166.

180. U. Rashid Sumaila, *Protected Marine Reserves as Fisheries Management Tools: A Bioeconomic Analysis*, 37 FISHERIES RES. 287, 287-96 (1998).

seas to the EEZs of all maritime countries. Finally, due to net straddling into EEZs, the resources of the high seas would be more equitably shared since Small Island Developing States, for example, would be able to also benefit from these resources.

We acknowledge that a precautionary closure of the high seas to fishing is a radical idea, but it is one we feel is at least worth considering. It would buy precious time to bring the high seas back to health, while fuller and more accountable management mechanisms are developed. Any organization entrusted with the task of managing and conserving global public goods should be fully capable and competent to fulfill that mandate on behalf of the global community, present and future generations included.¹⁸¹

181. Detailing how this suggestion might be implemented is left to future research, but the International Seabed Authority may serve as a good example of an institutional arrangement as an autonomous international organization established under the 1982 United Nations Convention on the Law of the Sea and the 1994 Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea. The Authority is the organization through which states party to the convention shall, in accordance with the regime for the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction (the Area) established in Part XI and the Agreement, organize and control activities in the Area, particularly with a view to administering the resources of the Area. INTERNATIONAL SEABED AUTHORITY, www.isa.org.jm/en/home (last visited May 28, 2014).