

**From *Mare Liberum* to *Mare Reservarum*: Canada's Opportunity for Global Leadership in Ocean Resource Governance**

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INTRODUCTION

In the early 17th century, Hugo Grotius, traditionally perceived as one of the fathers of international law, popularized the principle of *mare liberum*, or “freedom of the seas.”<sup>1</sup> Historically, the primary focus of this and other Law of the Sea concepts was ocean navigation and freedom of marine trade routes, with fisheries being of secondary importance.<sup>2</sup> Nevertheless, this notion of “freedom,” invoked by both States as well as individuals, continues to underlie many of the concepts, such as “open access,” that form the core of contemporary, international maritime law; and it is this concept that has dominated society’s approach to the rapidly growing human use of the ocean. Here, I argue that it is this fundamental concept, in conjunction with market-based economics now enshrined in our mentality as well as management and legal frameworks, that has led to resource overexploitation,

\* EDITORS’ NOTE.—The author would like to include the following note: Foremost, I would like to thank my friend and colleague, Garry Russ, for his inspiration and mentorship, and for coining the term *Mare Reservarum*; Daniel Pauly for encouragement to think broadly; and Daniel Pauly and Jackie Alder for critical comments. I acknowledge the support of The Pew Charitable Trusts, Philadelphia, for initiating and funding the *Sea Around Us* project. An earlier version of this paper was presented at the Ocean Management Research Network annual conference in Ottawa, November 2003.

1. H. Grotius, *De juri belli ac pacis libri tres*, alternative title: *Mare Liberum* (Amstelaedami: Apud Jassonio-Waesbergios, 1625), vol. 936; Anonymous, *Marine Fisheries and the Law of the Sea: A Decade of Change*, FAO Fisheries Circular 853 (Rome: FAO, 1993). For an informative insight into the global history of “freedom of the sea” see, R. P. Anand, “Non-European Sources of Law of the Sea,” in *Ocean Yearbook* 17 ed. E. Mann Borgese, A. Chircop and M. McConnell (Chicago: University of Chicago Press, 2003), pp. 1–18.

2. W. Graf Vitzthum, “From the Rhodian Sea Law to UNCLOS III,” in *Ocean Yearbook* 17 ed. E. Mann Borgese, A. Chircop and M. McConnell (Chicago: University of Chicago Press, 2003), pp. 56–59.

and, inherently, carries little incentive to conserve resources for use by future generations. Indeed, it is at the very heart of the Tragedy of the Commons.<sup>3</sup> I summarize two of the most promising solutions being offered to change the way we use marine resources to eventually achieve sustainability (which we presently do not have), and then propose that society undertakes a fundamental change in perspective and framework of ocean use, through revision of the international legal framework of ocean governance.<sup>4</sup> I suggest that Canada is ideally placed to take a global leadership position on this issue, and I propose major steps for Canada to take in such a direction, both nationally and internationally. Canada has a window of opportunity to become a global leader, and can achieve a turnaround in its global significance, despite having lost much of its international standing in recent years.

## BACKGROUND

With regard to fisheries resource exploitation, until the late 20th century, much of the world's oceans have generally been accessible to anyone who wanted to pursue fish. Starting in the 1970s, however, the declaration of 200 nautical mile (M) exclusive economic zones (EEZ) by a growing number of countries has resulted in most continental shelf and slope areas being placed under national jurisdiction with respect to resource use. Furthermore, given that 80 percent to 90 percent of global fisheries landings are also caught within 200 M of the coast, most of the global fish production became increasingly a national responsibility.<sup>5</sup> Thus, one would have hoped that the dilemmas of "race to fish" and "open access" could be more effectively addressed. Yet, over the last few decades we have seen, and continue to witness, stock declines and collapses, and fisheries closures. In light of these indicators, it is not far fetched to argue that we are witnessing a failure of control.<sup>6</sup>

In international waters, we continue to have open access conditions, leading to uncontrolled exploitation and circumvention of existing instruments and regulations, despite supposed flag-state responsibility. The most egregious examples of this are what is happening to the Patagonian tooth-

3. G. Hardin, "Fishing the Commons," *Natural History* 85, no. 7 (1976): 9–15.

4. This initial section leans on a short viewpoint expressed by G. R. Russ and D. Zeller, "From *Mare Liberum* to *Mare Reservarum*," *Marine Policy* 27 (2003): 75–78.

5. R. Watson, Senior Research Fellow, University of British Columbia, pers. comm. (11 January 2004); S. Jennings, M. J. Kaiser and J. D. Reynolds, *Marine Fisheries Ecology* (Oxford: Blackwell Science, 2001).

6. D. Pauly and R. Watson, "Counting the Last Fish," *Scientific American* (July 2003): 42–47.

fish, *Dissostichus eleginoides*,<sup>7</sup> as well as the concerns over growing threats of fishing on seamounts and other deep-sea resources.<sup>8</sup> A recent paper by J. Alder and G. Lugten documents that many regional and international management organizations appear to have failed in their management mandate for international marine resources.<sup>9</sup> Thus, in international waters, we might indeed be faced with complete absence of control using conventional mechanisms.<sup>10</sup>

International instruments, foremost the 1982 United Nations Convention on the Law of the Sea (UNCLOS),<sup>11</sup> as well as voluntary, nonbinding

7. The Patagonian toothfish is more palatably marketed as Chilean sea bass, and the majority of fish sold in the North American market are likely caught illegally. D. J. Agnew, "The Illegal and Unregulated Fishery for Toothfish in the Southern Ocean, and the CCAMLR Catch Documentation Scheme," *Marine Policy* 24, no. 5 (2000): 361–74. Notably, Canada has not been supportive of enforcement and compliance measures with respect to IUU (Illegal, Unregulated and Unreported) fishing; R. Rayfuse, "Canada and Regional Fisheries Organizations: Implementing the UN Fish Stock Agreement," *Ocean Development and International Law* 34 (2003): 209–28. In light of the growing problems of controlling IUU fishing, recent considerations of CITES listing of toothfish should be encouraged, as it would assist in monitoring and controlling catches and trade; D. Bialek, "Sink or Swim: Measures Under International Law for the Conservation of the Patagonian Toothfish in the Southern Ocean," *Ocean Development and International Law* 34 (2003): 105–37.

8. C. Roberts, "Deep Impact: The Rising Toll of Fishing in the Deep Sea," *Trends in Ecology and Evolution* 17, no. 5 (2002): 242–45; M. Lack, K. Short and A. Wilcock, "Managing Risk and Uncertainty in Deep-Sea Fisheries: Lessons from Orange Roughy," Report of TRAFFIC Oceania and WWF Australia Endangered Seas Programme (Sydney, 2003), p. 73.

9. J. Alder and G. Lugten, "Frozen Fish Block: How Committed are North Atlantic States to Accountability, Conservation and Management of Fisheries?," *Marine Policy* 26 (2002): 345–57.

10. However, it is worthwhile to note that the unconventional approaches to illegal fishing of toothfish undertaken by some CCAMLR member states ([www.ccamlr.org](http://www.ccamlr.org)), the growing international collaboration in such efforts, as well as recent considerations of CITES listing are promising indicators of a growing demand for drastic changes in how the international community does business; Bialek (n. 7 above). These approaches are also integral to the 1995 UN Fish Stocks Agreement, in which Canada was a major driving force. Interestingly, primarily on insistence from Canada, the Northwest Atlantic Fisheries Organization (NAFO) has dramatically improved its monitoring and enforcement initiatives within its area of jurisdiction. Unfortunately, Canada does not extend its actions equally to other fisheries concerns, for example, it has not supported trade-related enforcement measures against IUU fishing, and has not implemented the catch documentation scheme for toothfish, adopted by CCAMLR. Canada is now considered one of the world's leading "laundering" countries for illegally caught toothfish; Rayfuse (n. 7 above), p. 221.

11. United Nations Convention on the Law of the Sea, A/CONF.62/122. Entered into force, 16 November 1994. Available online: <http://www.un.org/depts/los/>.

soft law arrangements such as the United Nations Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries and others, have as a central concept the common heritage of mankind that underlies their argumentation and efforts.<sup>12</sup> This “heritage mindset” is also reflected in a growing number of national and regional instruments, and informs the definitions of such norms and principles as sustainability and precautionary approach. However, now, at the start of the 21st century we have to realise that, despite these efforts over the last few decades, overfishing continues. As a matter of fact, we now have what is increasingly referred to as a global fisheries crisis.

#### GLOBAL FISHERIES CRISIS

Scientific evidence for this crisis is increasingly being documented, and I will refrain from an extensive review, and restrict myself here to a summary of the major points.<sup>13</sup>

1. Global fisheries catches have, until very recently, been described as stable. However, we now know that in fact they have been declining for the last decade.<sup>14</sup> This change in trend should fundamentally alter investment decisions made by firms and banks with regards to the fisheries sector, particularly in light of significant overcapacity in fishing fleets driven by substantial subsidies.<sup>15</sup>

12. FAO, *Code of Conduct for Responsible Fisheries*, Food and Agricultural Organization of the United Nations (Rome: FAO, 1995); W. Graf Vitzthum (n. 2 above).

13. D. Pauly, V. Christensen, S. Guénette, T. J. Pitcher, U. R. Sumaila, C. J. Walters, R. Watson and D. Zeller, “Towards Sustainability in World Fisheries,” *Nature* 418 (2002): 689–95; R. A. Myers and B. Worm, “Rapid Worldwide Depletion of Predatory Fish Communities,” *Nature* 423 (2003): 280–83; R. Hilborn, T. A. Branch, B. Ernst, A. Magnusson, C. V. Minte-Vera, M. D. Scheuerell and J. L. Valero, “State of the World’s Fisheries,” *Annual Review of Environment and Resources* 28 (2003): 15.1–15.40.

14. R. Watson and D. Pauly, “Systematic Distortions in World Fisheries Catch Trends,” *Nature* 414 (2002): 680–95.

15. P. M. Mace, “Developing and Sustaining World Fisheries Resources: The State of Fisheries and Management,” in *Proceedings of the Second World Fisheries Congress*, ed. D. H. Hancock, D. C. Smith and J. Beumer (Collingwood: CSIRO Publishing, 1997), pp. 1–20; C. Clark and G. R. Munro, “The Problem of Overcapacity,” *Bulletin of Marine Science* 70, no. 2 (2002): 473–83; G. R. Munro and U. R. Sumaila, “The Impact of Subsidies Upon Fisheries Management and Sustainability: The Case of the North Atlantic,” *Fish and Fisheries*, no. 3 (2002): 1–18; Maritime Awards Society of Canada, “Revisiting the Law of the Sea,” Report of the Meeting of Experts Organized by the Maritime Awards Society of Canada (Maritime Awards Society of Canada, Victoria, 2003).

2. There is a growing global trend towards landing catches from lower trophic levels; this is now well known as “fishing down marine food webs.”<sup>16</sup> This is a concern, violating both the precautionary as well as sustainability principles, as it implies that we are progressively removing from the ecosystem the large, long-lived species at the top of the food web, leading to impoverished and weakened systems with substantially reduced biomass.<sup>17</sup> Incidentally, the same drastic declines can be observed in the majority of traditional single-species stock assessments undertaken by agencies tasked by our governments to assess stocks and provide scientific advice for management.<sup>18</sup> Yet, little, if any, significant action has been taken to change the observed trends.
3. A large proportion of marine primary production is now used to sustain fisheries catches. For continental shelf areas, the proportion of primary production used to sustain fishing (~24 percent to 35 percent) is now approaching the proportion of primary production being appropriated by humans in the terrestrial environment (~35 percent to 40 percent).<sup>19</sup> Thus, human influence on marine ecosystems, in terms of the energy we extract, is approaching the level of impact we have on terrestrial systems, illustrating that our present activities are approaching the energetic limits of natural marine systems.
4. Assessments over the last few years have illustrated that there is a shrinking availability of under- or unexploited stocks. This implies that there are few if any new stocks left for fisheries to expand into, or for fleets displaced from declining/collapsing stocks to move into.<sup>20</sup> The current trend towards increasingly targeting deeper water stocks is also not the answer; as such fisheries are not sustainable due

16. D. Pauly, V. Christensen, J. Dalsgaard, R. Froese and F. Torres, “Fishing Down Marine Food Webs,” *Science* 279 (1998): 860–63; D. Pauly, V. Christensen, R. Froese and M. L. Palomares, “Fishing Down Aquatic Food Webs,” *American Scientist* 88 (Jan–Feb 2000): 46–51.

17. D. Pauly et al. (n. 13 above); Myers and Worm (n. 13 above); V. Christensen, S. Guénette, J. J. Heymans, C. J. Walters, R. Watson, D. Zeller and D. Pauly, “Hundred-Year Decline of North Atlantic Predatory Fishes,” *Fish and Fisheries* 4 (2003): 1–24. J. K. Baum, R. A. Myers, D. G. Kehler, B. Worm, S. J. Harley and P. A. Doherty, “Collapse and Conservation of Shark Populations in the Northwest Atlantic,” *Science* 299 (2003): 389–92; B. Worm, H. K. Lotze and R. A. Myers, “Predator Diversity Hotspots in the Blue Ocean,” *Proceedings of the National Academy of Sciences* 100, no. 17 (2003): 9884–88.

18. V. Christensen et al. (n. 17 above), figure 12, pp. 18–19.

19. D. Pauly and V. Christensen, “Primary Production Required to Sustain Global Fisheries,” *Nature* 374 (1995): 255–57.

20. R. J. R. Grainger and S. M. Garcia, “Chronicles of Marine Fishery Landings (1950–1994): Trend Analysis and Fisheries Potential,” *FAO Fisheries Technical Paper* 359 (1996): 51; R. Froese and D. Pauly, “Dynamik der Überfischung,” in *Warnsignale aus Nordsee und Wattenmeer—Eine aktuelle Umweltbilanz*, ed. J. Lozán, E. Rachor, K. Reise, J. Sündermann and H. von Westernhagen, (Hamburg: GEO, 2003), pp. 288–95.

to the life-history dynamics of the species involved.<sup>21</sup> Given these ecological fundamentals, it is a serious concern that 40 percent of global trawling grounds are now deeper than shelf waters (200 m). Increasingly, deep-water fisheries are being viewed not as fisheries, but rather as inherently unsustainable mining operations, and deep-water stocks as nonrenewable resources.<sup>22</sup>

5. Historic evidence suggests that early overfishing (starting centuries ago) still shapes the structure and function of present-day coastal ecosystems.<sup>23</sup> Thus, these ecosystems were historically impacted even prior to industrial fishing. This trend has accelerated over the last decades, in line with the rapid expansion of modern fishing techniques. Furthermore, humanity has shown little capacity to fully understand, appreciate, and account for the changes their past actions have caused to marine systems, once those changes are outside the observers' generational memory. This phenomenon is nicely summarized in the concept of the "shifting baseline syndrome."<sup>24</sup> In essence, this implies that we (no matter if scientist, manager, general public, or fisher) do not *really* appreciate what ecosystems and stocks looked like prior to our individual time-line of memory and personal experience (at most including input from our parental generation). This has severe implications for our understanding and acceptance of past ecosystems, and results in a conceptual downward spiral in what each subsequent generation accepts as "pristine." Here, I contend that it is not so much a matter of debate as to where along this downward spiral we are,<sup>25</sup> but rather that we decide on how we are

21. Deep sea species, for example, orange roughy (*Hoplostethus atlanticus*) or Patagonian toothfish, are generally very long-lived and slow growing, reach sexual maturity late, and often have low fecundity (reproductive output). Such species make for very unproductive stocks that are easily overexploited, and whose populations recover far slower (centuries) than economic considerations account for; Lack et al. (n. 8 above); Roberts (n. 8 above).

22. C. Roberts (n. 8 above).

23. J. B. C. Jackson, M. X. Kirby, W. H. Berger, K. A. Bjorndal, L. W. Botsford, B. J. Bourgue, R. H. Bradbury, R. Cooke, J. Erlandson, J. A. Estes, T. P. Hughes, S. Kidwell, C. B. Lange, H. S. Lenihan, J. M. Pandolfi, C. H. Peterson, R. S. Steneck, M. J. Tegner and R. R. Warner, "Historical Overfishing and the Recent Collapse of Coastal Ecosystems," *Science* 293 (2001): 629–38; J. M. Pandolfi, R. H. Bradbury, E. Sala, T. P. Hughes, K. A. Bjorndal, R. G. Cooke, D. McArdle, L. McClenachan, M. J. H. Newman, G. Paredes, R. R. Warner and J. B. C. Jackson, "Global Trajectories of the Long-term Decline of Coral Reef Ecosystems," *Science* 301 (2003): 955–58.

24. D. Pauly, "Anecdotes and the Shifting Baseline Syndrome of Fisheries," *Trends in Ecology and Evolution* 10 (1995): 430.

25. Note that I do not suggest that this should be a reason to abandon efforts of investigation. Indeed, these are areas of urgent ecological, social and economic research needs. Rather, I suggest that delaying agreement on the need to act decisively and speedily is inappropriate, and is not in line with the precautionary principle.

going to stop this decline, and how we might be able to get back to higher, and more productive, biomass levels, and rebuild a diverse and healthy ecosystem structure.

This brief review of key symptoms of the global decline in fisheries resources and associated ecosystem structure should suffice to illustrate that we, indeed, have a crisis at our hands. Having recognized the problem, we have to realize that we are at a crossroads, and have to make conscious and hard decisions to change direction. Hence, as a society, we have to ask where we want to go from here.

#### WHERE TO FROM HERE?

As I indicated earlier, the world is slowly relinquishing the notion of unrestricted freedom of the seas with regards to resource use, and is slowly adopting a “heritage mindset.” However, declining global fisheries landings, ongoing fisheries management failures in many parts of the world, damaging subsidies, and our lack of genuine understanding of just how degraded marine ecosystems are (i.e., shifting baseline syndrome), indicate that a change in mindset, while necessary, is not enough. Indeed, I propose it is time that we support the “heritage” notion with more fundamental, yet concrete action. While there are several promising national and local activities being undertaken that fall into a new direction, in general, these are very limited in scope and scale.<sup>26</sup> I argue that it is time to also act on a global scale, and, in particular, I suggest it is time that the international community moves on from Hugo Grotius.<sup>27</sup>

One may ask why overfishing should be addressed globally, given that the majority of catches are taken from waters that fall within national jurisdictions? Firstly, fisheries products are one of the most globally traded products and have an internationally integrated price structure; a large

26. For example, the spatial management actions taken on Georges Bank. S. A. Murawski, R. W. Brown, S. X. Cadrin, R. K. Mayo, L. O’Brien, W. J. Overholtz and K. A. Sosebee, “New England Groundfish,” (NOAA: Our living oceans: report on the status of U.S. living marine resources, NOAA Technical Memorandum NMFS-F/SPO-41, 1999) pp. 71–80; S. A. Murawski, R. Brown, H. L. Lai, P. J. Rago and L. Hendrickson, “Large-scale Closed Areas as a Fishery-Management Tool in Temperate Marine Systems: The Georges Bank Experience,” *Bulletin of Marine Science* 66, no. 3 (2000): 775–98; A. A. Rosenberg, “Managing to the Margins: The Overexploitation of Fisheries,” *Frontiers in Ecology and the Environment* 1, no. 2 (2003): 102–106.

27. G. R. Russ and D. Zeller (n. 4 above).

proportion of global catches is sold on international markets.<sup>28</sup> Hence, international connectivity of fisheries is high in terms of economics, trade, and industry patterns and pressures. This translates into pressures for over-exploitation at national levels, and implies that the notion of fisheries as purely national affairs is outdated. Secondly, given the internationally growing demand for consideration of ecosystem level effects of and ecosystem-based management approaches to resource use, fishers and managers have to finally accept that stocks, and even large-scale ecosystems, cannot be viewed and treated in isolation. As is the case with the world's climate, actions (or inactions) in one area will eventually have influences on other parts of the globe. The effects of acid rain falling into Scandinavian lakes, yet originating from emissions over the United Kingdom is only one example of global connectivity; while the growing incidence of polychlorinated biphenyls (PCBs) and other pollutants appearing in Arctic and Antarctic ecosystems, far from their source, is another. Thus, just like the growing demands and urgency for global actions with regards to climate change, so overfishing too has to be addressed at the scale at which it is happening: globally.

One may maintain that international instruments, calling on the theme of "heritage," do indeed deal with this problem globally, by urging the international community to treat marine resources as "heritage" property. But what does "heritage" imply? Two closely associated terms immediately spring to mind: "value" and "inheritance." Both of these, of course, imply willingness on our behalf to "save," "invest" and let the assets "grow." Since I have now, in this context, changed to financial "investment portfolio" language, may I simply point out that, based on our record to date, we are very poor "investment" managers, are rapidly failing the grade, and ought to be fired. Instead of ensuring "growth," or at least "preservation" of the asset "capital" for future use (and future generations),<sup>29</sup> through "saving and investing" via the utilization of part of the accumulating "interest" only, we have now reached a point where it is beyond doubt that we are depleting the underlying "capital," in addition to the "interest," of our marine "investment portfolio." In essence, we are stealing from our children. How and why are we doing this, and what are the key steps we need to take to change this?

28. F. Asche, H. Bremnes and C. R. Wessells, "Product Aggregation, Market Integration, and Relationships between Prices: An Application to World Salmon Markets," *American Journal of Agricultural Economics* 81 (1999): 568–81; U. R. Sumaila, R. Chuenpagdee and M. Vasconcellos, ed., *Proceedings of the INCO-DC International Workshop on Markets, Global Fisheries and Local Development*, (Brussels: ACP-EU Fisheries Research Report 7, 2000); Watson and Pauly (n. 14 above), p. 534.

29. Of major importance in this context is the fact that the economic interests of future generations have not been adequately (if at all) accounted for in economic analyses. A novel integrated economic approach to accounting for intergenerational equity is presented by U. R. Sumaila and C. Walters, "Intergenerational Discounting: A New Intuitive Approach," *Ecological Economics* (in press).



There have been several studies dealing with this problem,<sup>30</sup> and I would like to simply focus on the two most important and most fundamental components that need to be considered and addressed, and will refer to these as “global focal points.”

#### Global Focal Point One

We know that there is a substantial global overcapacity in fisheries, with conservative values of 30 percent to 50 percent.<sup>31</sup> It has even been suggested that this capacity may exceed that needed to catch the current global landings by a factor of two or three.<sup>32</sup> It is this global overcapacity, leading to highly excessive levels of fishing effort, which has led to exploitation rates in excess of any notion of sustainability. This excess capacity has been shown to be driven and maintained by subsidies, estimated to be in the range of US\$2.0–2.5 billion/year for the North Atlantic alone, and in the range of US\$15–50 billion/year globally.<sup>33</sup> The amount of global subsidies paid by taxpayers to the fishing industry is thus equivalent to the total gross domestic product (GDP) of some small countries.<sup>34</sup> In the case of the North Atlantic, almost 50 percent of these subsidies are deemed to be damaging.<sup>35</sup>

Thus, as a first initiative, to be tackled decisively in the face of opposition from short-term industry interests, society needs to demand sequential reductions of subsidies.<sup>36</sup> In this context it is important to note that even subsidies used for vessel decommissioning schemes can be highly negative in their impacts, and thus need to be considered very cautiously.<sup>37</sup>

#### Global Focal Point Two

We also know that today’s fishing fleets, thanks to the immense technological developments over the last few decades, can virtually reach any part of the

30. D. Pauly et al. (n. 13 above); D. Pauly and J. Maclean, *In a Perfect Ocean: The State of Fisheries and Ecosystems in the North Atlantic Ocean* (Washington: Island Press, 2003); Hilborn et al. (n. 13 above).

31. S. M. Garcia and I. De Leiva Moreno, “Global Overview of Marine Fisheries,” in *Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem* (Reykjavik, Iceland, 1–4 October 2001).

32. D. Pauly et al. (n. 13 above); Pauly (n. 24 above).

33. FAO (n. 12 above); Munro and Sumaila (n. 15 above); M. Milazzo, “Subsidies in World Fisheries: A Re-Examination,” (Washington: World Bank Technical Paper No. 406, 1998).

34. For example, the 2002 GDP for Botswana was US\$15.1 billion, and for Bulgaria US\$50.6, according to the World Factbook, [www.odci.gov/cia/publications/factbook/index.html](http://www.odci.gov/cia/publications/factbook/index.html). (accessed November 2003).

35. G. R. Munro and Sumaila (n. 15 above).

36. D. Pauly et al. (n. 13 above); Clark and Munro (n. 15 above).

37. G. R. Munro and U. R. Sumaila (n. 15 above).

ocean.<sup>38</sup> Thus, there are virtually no areas left that are devoid of potential fisheries impacts, and hence, we have removed essentially all natural refuges for stocks. And it is only such refuges that have the capacity to buffer stock variation, protect biodiversity, maintain and recover ecosystem structures, as well as act as an insurance policy for the deep, inherent uncertainty in management and assessment capability.<sup>39</sup> To address this dramatic change in accessibility of the oceans, a growing number of scientists are calling for the use of large-scale marine reserves, or permanent no-take areas, as the only suitable mechanism to restore this buffering and insurance capacity of marine ecosystems.<sup>40</sup> For example, in 1998, C. Walters wrote that,

Instead of treating the seas as open to fishing with small exceptions (marine refugia), we will only safely limit harvest rates if we reverse this view and treat the seas as closed to fishing with small exceptions (limited fishing areas and times).<sup>41</sup>

Setting up global networks of large, permanent no-take zones is not only an insurance policy to cope with natural and scientific uncertainty, but also assists in coping with the inevitable failures in management and science that we will continue to witness in the future.<sup>42</sup>

Indeed, a colleague and I are suggesting that we need to change our fundamental perspective and legal framework of ocean use to facilitate this change of view.<sup>43</sup> We make the case that the current concept centered on and

38. C. Roberts (n. 8 above); Pauly et al. (n. 13 above).

39. For an interesting and timely exposé on needed changes to stock assessments, see C. Walters and S. J. D. Martell, "Stock Assessment Needs for Sustainable Fisheries Management," *Bulletin of Marine Science* 70, no. 2 (2002): 629–38.

40. J. A. Bohnsack, "Application of Marine Reserves to Fisheries Management," *Australian Journal of Ecology* 23 (1998): 298–304; S. N. Murray, R. F. Ambrose, J. A. Bohnsack, L. W. Botsford, M. A. Carr, G. E. Davis, P. K. Dayton, D. Gotshall, D. R. Gundersen, M. A. Hixon, J. Lubchenko, M. Mangel, A. MacCall, D. McArdle, J. C. Ogden, J. Roughgarden, R. M. Starr, M. J. Tegner and M. M. Yoklavich, "No-take Reserve Network: Sustaining Fishery Populations and Marine Ecosystems," *Fisheries* 24, no. 11 (1999): 11–25; C. Roberts, J. A. Bohnsack, F. Gell, J. P. Hawkins and R. Goodridge, "Effects of Marine Reserves on Adjacent Fisheries," *Science* 294, no. 5548 (2001): 1920–23; G. R. Russ, "Yet Another Review of Marine Reserves as Reef Fisheries Management Tools," in *Coral Reef Fishes: Dynamics and Diversity in a Complex Ecosystem*, ed. P. F. Sale (San Diego: Academic Press, 2002), pp. 421–43.

41. See p. 279, C. Walters, "Designing Fisheries Management Systems that Do Not Depend upon Accurate Stock Assessment," in *Reinventing Fisheries Management*, ed. T. Pitcher, P. J. B. Hart and D. Pauly (London: Kluwer Academic Publishers, 1998).

42. Note that this approach can also benefit highly migratory pelagic species, Worm et al. (n. 17 above); F. Gell and C. Roberts, "Benefits Beyond Boundaries: The Fishery Effects of Marine Reserves," *Trends in Ecology and Evolution* 18, no. 9 (2003): 448–55.

43. G. R. Russ and D. Zeller (n. 4 above).

evolved from *mare liberum*, which has led us to our current predicament due to its notion of freedom of the sea, is outdated in light of modern fleets enmeshed in a global trading network and globalized economy. Although *mare liberum* was intended to ensure access of states to the high seas, it has in effect been transformed into an “expectation” or “right” of individuals to exploit marine resources. This notion of “right,” based on interpretation and customary acceptance of the concept of *liberum* has “individualized” *mare liberum* with regards to resource exploitation. Fleets with enormous catching capacity and technological capabilities need to be viewed, particularly in light of the uncertainties inherent in natural systems, with a fundamentally different legal framework, inherently embedding a deep precautionary principle. Thus, I propose we adopt a new legal framework centered around the concept of *mare reservarum*, which is based on a notion of “spatially limited access” to resources, and has as its central tenet that a substantial part of the world’s oceans are, by default, off limits to resource extraction and form a large part of the precautionary “capital” in our marine resource “portfolio.”<sup>44</sup> I argue that changing the currently embedded concept of “freedom” to one of “inherent spatial limitation” is the only way we can avoid the marine “bankruptcy” we are facing, and act in a precautionary manner. Thus, we have to move from the present antiprecautionary ethics of “ocean use” to a precautionary “ocean care” approach.<sup>45</sup> Contrary to initial perception, *mare reservarum* is not only targeted at individuals such as fishers, but rather at states as the political entity representing society, as is *mare liberum*. National (within EEZs) and flag State (high seas) responsibility is as central to *mare reservarum* as it is to *mare liberum*. However, the underlying emphasis is changed from fundamentally available for exploitation to principally not available (with selected areas open to regulated fishing). In practicality, and in light of the increasing globalization of human affairs, this implies that we need to give specific responsibility, international accountability, and enforce-

44. A blueprint for global consideration is the example being set by Australia which in early 2004 passed legislation to increase no-take zones in the Great Barrier Reef World Heritage Area from previously less than 5 percent to 33 percent, resulting in a 155,000 km<sup>2</sup> network of no-take zones. While World Heritage designation and Marine Park status clearly assisted in this development, it serves as an example of the direction we need to take globally, and has strong scientific support ([www.barrierreef.org/whatsnew/scicom.cfm](http://www.barrierreef.org/whatsnew/scicom.cfm), accessed: 18 May 2004); J. Day, L. Fernandes, A. R. Lewis, G. De’ath, S. Slegers, B. Barnett, B. Kerrigan, D. Breen, J. Innes, J. Oliver, T. Ward and D. Lowe, 2002. “The Representative Areas Program for Protecting Biodiversity in the Great Barrier Reef World Heritage Area,” in *Proceedings of the Ninth International Coral Reef Symposium*, ed. M. K. Kasim Moosa, S. Soemodihardjo, A. Nontji, A. Soegiarto, K. Romimohtarto, Sukarno and Suharsono (Jakarta: Published by the Ministry of Environment, the Indonesian Institute of Sciences and the International Society for Reef Studies, 2002), pp. 687–96.

45. A. A. Rosenberg (n. 26 above); the terms ‘ocean use’ and ‘ocean care’ were used by A. A. Rosenberg at the Fourth World Fisheries Congress, Vancouver, 2–6 May 2004.

ability for resource management in international areas to specific entities such as existing international institutions (e.g., a significantly modified, reformed, and empowered FAO or the International Maritime Organization), Regional Indigenous Organizations (also with substantial regional empowerment and accountability),<sup>46</sup> or reorganize into a new Ocean Resource Governance agency.<sup>47</sup> A first step in this direction is unquestionably a major revision of the Law of the Sea to bring it into the reality of the 21st century,<sup>48</sup> through a series of UNCLOS style conferences,<sup>49</sup> focusing on precautionary resource use in an ecosystem setting based on the concept of *mare reservarum* and the other ecosystem-based precautionary directions indicated earlier.<sup>50</sup> A good starting point for such a revision is to seriously consider the 20/20 initiative, which suggests that we remove 20 percent of all marine ecosystems from exploitation by 2020.<sup>51</sup> Thus, the underlying legal and governance framework would be centered on the notion that 20 percent

46. R. Rayfuse (n. 7 above); L. Hinds, "Policy Implications and Reconstruction of Marine Institutional Architecture: The Regional Indigenous Organization (RIO) Option," *Marine Policy* 25 (2001): 415–26; L. Hinds, "Ocean Governance and the Implementation Gap," *Marine Policy* 27 (2003): 349–56.

47. G. R. Russ and D. Zeller (n. 4 above). Currently separate, sectoral entities, such as the International Seabed Authority, and FAO Fisheries Department, etcetera, might need to be integrated into a global authority dealing with ocean resource governance. Given the scale of ocean governance issues, and the long ignored fact that over 70 percent of the Earth is covered by oceans, this new entity would clearly need to be a senior body within the UN system and incorporate empowered international legal and conflict resolution bodies and tribunals. Such an international authority was proposed as far back as 1953 by the International Law Commission during early deliberations leading to UNCLOS; Rayfuse (n. 7 above). Although at the time never acted upon due to a lack of political will (and the victim of the Cold War), I argue that it is time to revisit this idea in conjunction with the urgently required reorganization and revision of the entire UN system.

48. This has also been suggested, for example, by expert discussions such as those facilitated by the Maritime Awards Society of Canada in early 2003. The associated report can be found at <http://www.maritimeawards.ca/>.

49. While a revision of the Law of the Sea is not explicitly provided for in the Convention, Article 312 provides that state parties can propose amendments and request the convening of such conferences 10 years after entry into force of the Convention. This review period commences after November 2004. T. L. McDorman, "Canada Ratifies the 1982 United Nations Convention on the Law of the Sea: At Last," *Ocean Development & International Law* 35 (2004): 103–14.

50. I refrain here from considerations of issues related to free navigation and trade, or the growing concerns about security, which are currently pointing at increasingly serious considerations of *mare clausum*, sensu J. Selden and M. Nedham, *Of the Dominion or Ownership of the Sea. Translation of: Mare Clausum, seu, de Domino Maris*, (London: William Du-Gard, 1652); J. L. Suárez de Vivero and J. C. Rodríguez Mateos, "New Factors in Ocean Governance. From Economic to Security-Based Boundaries," *Marine Policy* 28 (2004): 185–88.

51. C. Roberts and J. P. Hawkins, *Fully-Protected Marine Reserves: A Guide* (Washington: WWF Endangered Seas Campaign, 1250 24th Street, NW, Washington, DC 20037, United States of America and Environment Department, University of York, York YO10 5DD, 2000), p. 44.

of any given habitat/area is permanently removed from exploitation. Within individual EEZs, national responsibility and accountability would hold forth, while high seas areas would continue to require international approaches, including participation of non-state interested parties.<sup>52</sup> Clearly, this has to be accompanied by the substantial capacity reductions mentioned earlier.

#### CANADA: LEADER OR FOLLOWER?

Canada was once known for global leadership in peace keeping and international law, and played a significant and active role in driving the development of UNCLOS. However, over the last 10+ years, Canada has slipped in its international status and reputation, due to significant declines in engagement and funding.<sup>53</sup> While reasons related to jurisdiction over the Atlantic continental shelf waters beyond the EEZ, and associated with this, delays in ratification of the 1995 UN Fish Stocks Agreement by the European Union, had delayed Canada's ratification of UNCLOS by over 2 decades, these limitations have finally been addressed.<sup>54</sup> In November 2003, Canada finally ratified the United Nations Convention on the Law of the Sea. It is now time for the Canadian government to actively engage in global activities with regards to ocean resource use through building an international leadership capacity to match that enjoyed in human rights.<sup>55</sup> I would like to suggest, from a position outside of governmental organizations, what national and international steps Canada should urgently take to attain regional and global significance.<sup>56</sup>

52. The Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean, as adopted in 2000 may be viewed as a starting point, despite its shortcomings; L. Cordonnery, "A Note on the 2000 Convention for the Conservation and Management of Tuna in the Western and Central Pacific Ocean," *Ocean Development and International Law* 33 (2002): 1–15. Integral to any future international or regional approach has to be a full suite of embedded and empowered enforcement and conflict resolution instruments along the lines of the International Court of Justice or the International Tribunal for the Law of the Sea.

53. Canada's effort in the development of the 1995 UN Fish Stocks Agreement seems an exception to this; Rayfuse (n. 7 above).

54. Rayfuse (n. 7 above), p. 218.

55. Canada's good international record on human rights allowed a Canadian UN war crimes prosecutor at the International War Crimes Tribunal (Justice Louise Arbour) to pursue the indictment of S. Milosevic with moral authority, without this being viewed as hypocritical; Daniel Pauly, Professor, University of British Columbia, pers. comm. (23 December 2003). For fisheries, however, Canada has no such moral authority, as its governance and management record with respect to its fisheries is poor.

56. Canada's leaders should consider cautiously that short-term self-interest with respect to the conduct of the ill-fated and scientifically unwarranted Newfoundland inshore cod fishery in the late 1990s has clouded Canada's international reputation for precautionary fisheries management considerably; Rayfuse (n. 7 above), p. 216.

## Nationally: Set Examples

Canada has an immense and geographically complex coastline, and the area of its EEZ is equivalent to approximately 30 percent of its landmass.<sup>57</sup> It is home to what was once, undoubtedly, the most productive fishing grounds on Earth, and its substantial Arctic coastal and marine areas are of increasing economic, ecological and geopolitical significance.<sup>58</sup> Thus, despite historic national focus on terrestrial issues (being the land of forests, prairies, lakes, and snow and ice), Canada's three oceans are of immense significance to national well being, security, and prosperity.<sup>59</sup> How can Canadians and their government ensure best practice in the future management of this resource, despite significant past and present problems?<sup>60</sup>

I would like to focus on what are, in my opinion, the three most pressing national aspects on which Canada needs to act. Firstly, Canada passed the Oceans Act in 1996,<sup>61</sup> and in 2002 released the associated policy statement, Canada's Oceans Strategy.<sup>62</sup> However, on the ground, little real activity has happened within the nominated lead agency, Fisheries and Oceans Canada (DFO). There are signs that lack of designated funding and institutional leadership are handicapping efforts to implement the Act and Strategy in a decisive and thorough manner.<sup>63</sup> The recommendation by the Canadian Parliament's Standing Committee on Fisheries and Oceans that DFO prepare regular annual reports documenting progress in implementation of the

57. [http://www.cos-soc.gc.ca/dir/facts\\_e.asp](http://www.cos-soc.gc.ca/dir/facts_e.asp). (accessed November 2003)

58. R. Huebert, "Climate Change and Canadian Sovereignty in the Northwest Passage," *Isuma: Canadian Journal of Policy Research* 2, no. 4 (2001): 86–94; D. M. Johnston, "The Northwest Passage Revisited," *Ocean Development and International Law* 33 (2002): 145–64; R. Huebert, "New Challenges to Canadian Arctic Security and Sovereignty," (Montreal: Centre for Research and Information on Canada, The Canadian North: Embracing Change: The CRIC Papers 6, 2002), pp. 30–35.

59. G. Chao "Moving from International "Good Steward" to Domestic Integrated Manager: Challenges of Importing Principles of Integrated Coastal and Ocean Management into Canada's Oceans Law," in *Ocean Yearbook* 16, ed. E. Mann Borgese, A. Chircop and M. McConnell (Chicago: University of Chicago Press, 2002): 421–62; L. Juda, "Changing National Approaches to Ocean Governance: the United States, Canada, and Australia," *Ocean Development and International Law* 34 (2003): 161–87.

60. Canada's inability to govern the majority of its fisheries in a sustainable and precautionary manner is handicapping Canada's global standing in fisheries management and ocean resource governance; Rayfuse (n. 7 above); Chao (n. 59 above); Juda (n. 59 above), p. 170.

61. Oceans Act (1996, c. 31), online: <http://laws.justice.gc.ca/en/O2.4/text.html>. (accessed November 2003)

62. Juda (n. 59 above).

63. The slowness in response through the Oceans Act to threats to deep-water coral beds is a case in point, M. Willison, "Science and Policy for Marine Sanctuaries," *Biodiversity* 3 (2002): 15–20.

Oceans Act is also clearly indicative of lack of progress.<sup>64</sup> Indeed, Australia, having launched its Oceans Policy in 1998 under the direction of the Ministry of Environment and Heritage, appears to be rapidly leaving Canada behind in ocean planning and management, despite having their own institutional and political problems of implementation.<sup>65</sup> Thus, for Canada to decisively and significantly move on funding and implementation of the Oceans Act and Strategy, and create follow-on legislation, policies and directives to counteract the obvious problems that have been identified with the current management set-up,<sup>66</sup> would be of major importance for sending clear signals to Canadians and the global community, and of fundamental importance if Canada wants to be taken seriously in the international sphere.

Secondly, there is an obvious need to revise and rewrite the Fisheries Act of 1985,<sup>67</sup> to embed current ecosystem considerations, knowledge, and principles into the legal framework. For example, a revised Fisheries Act should center on ecosystem-based considerations, focus on ecological precautionary approaches, embed a shifted burden-of-proof as default, and elevate the current use of fisheries closures to a central tenet of permanent no-take zones as a principal cornerstone of the Act.<sup>68</sup> Together with the emerging significance of the Species at Risk Act<sup>69</sup> (SARA, Canadian endangered species legislation), which may increasingly influence and drive fisheries management (due to significant legal requirements inherent to SARA), such a revised Fisheries Act needs to inherently embed into its framework the overriding legal requirement for long-term sustainable levels of catches founded on ecological precautionary approaches, enmeshed with ecosystem recovery and maintenance priorities.<sup>70</sup> It should also enshrine, into the legal framework, the avoidance of perverse economic incentives (damaging subsidies) to reduce and control capacity. And finally, and likely to be heavily opposed by short-term focused industry

64. Juda (n. 59 above), p. 174.

65. See [www.oceans.gov.au](http://www.oceans.gov.au). (accessed November 2003) Anonymous, "Annual Report, National Oceans Office," (Hobart, Australia: Australian Government National Oceans Office, 2003), Juda (n. 59 above), p. 64.

66. Juda (n. 59 above), p. 172–73. The Act itself would also require reviewing and strengthening, particularly with respect to the application of the precautionary approach, Chao (n. 59 above).

67. Fisheries Act (R.S. 1985, c. F-14), online: <http://laws.justice.gc.ca/en/F-14/text.html>. (accessed November 2003)

68. D. R. Russ and D. Zeller (n. 4 above); T. Gerrodette, P. K. Dayton, S. Macinko and M. J. Fogarty, "Precautionary Management of Marine Fisheries: Moving Beyond Burden of Proof," *Bulletin of Marine Science* 70, no. 2 (2002): 657–68; A. A. Rosenberg, "The Precautionary Approach in Application from a Manager's Perspective," *Bulletin of Marine Science* 70, no. 2 (2002): 577–88.

69. Species at Risk Act (2002, c. 29), online: <http://laws.justice.gc.ca/en/S-15.3/text.html>. (accessed November 2003).

70. Rosenberg (n. 26 above), p. 581.

interests, the revised Act could also focus on reducing the use of habitat damaging gears such as bottom trawls.<sup>71</sup>

Thirdly, and significantly, Canada needs to evaluate the fundamental contradiction of having a single government department (Fisheries and Oceans Canada) responsible for both the exploitation (i.e., fisheries and aquaculture) as well as conservation of ocean resources and ecosystems. Inherently, such an arrangement produces substantial internal conflict, and leads to public perception of bias in departmental decision making, resulting in a noticeable lack of public trust. Canada might do well to consider moving the responsibility, and power, for ocean conservation and ecosystem protection to a separate government body solely charged with conservation and protection, such as Environment Canada.<sup>72</sup>

While I am aware that both the Oceans Act and the Fisheries Act do incorporate, in their current form, closed areas as a management option (Marine Protected Areas in case of the former, and Fisheries Closures in the later), the extent of their use, definition, and focus is not a central tenet of each instrument. This is where I consider Canada could lead the world by setting an example of the deep and fundamental changes required with regards to ecosystem-based management, precautionary approaches, and sustainability. Having set a clear precedent through funding, implementation, and further development of the Oceans Act, and a fundamental revision of the Fisheries Act around ecosystem and precautionary considerations, and based on the notion described by *mare reservarum*, Canada would be in a globally unique position to engage in and drive the changes urgently needed in the way the world uses marine resources.

71. S. Roberts and M. Hirshfield, "Deep Sea Corals: Out of Sight, But No Longer Out of Mind," *Frontiers in Ecology and the Environment* 2, no. 3 (2004): 123–30; R. Chuenpagdee, L. E. Morgan, S. M. Maxwell, E. A. Norse and D. Pauly, "Shifting Gears: Assessing Collateral Impacts of Fishing Methods in US Waters," *Frontiers in Ecology and the Environment* 1, no. 10 (2003): 517–24; L. Watling and E. A. Norse, "Disturbance of the Seabed by Mobile Fishing Gear: A Comparison to Forest Clearcutting," *Conservation Biology* 12, no. 6 (1998): 1180–97. But see Rosenberg (n. 26 above), p. 583 for a discussion on the complexity of gear issues.

72. Note that, as indicated above, Australia's Oceans Policy is under the purview of the Ministry of Environment and Heritage. Interestingly, Environment Canada and the Parks Canada Agency are increasingly active in ocean protection and sustainability issues through the Marine Wildlife Areas Program and the National Marine Conservation Areas Program (NMCA), respectively. At this time, especially Parks Canada's NMCA program appears to be leading national efforts related to *Mare Reservarum*. Significant in the present context, however, is the fact that management initiatives with respect to fisheries within NMCA's will continue to be influenced and likely managed by DFO. Furthermore, the fact that the Parks Canada Agency's initiative on NMCAs (under purview of the Minister of the Environment) seems to be advancing steadily, if slowly, with regards to spatial zoning on larger scales, indicates that the inherent conflict potential as indicated here, may indeed be hampering DFO's Oceans Act activities.



### Internationally: Drive Change

Having set a clear example at home of engaging in the distinct changes needed for finally moving towards sustainability of marine resource use, Canada would be in an exemplary position to actively drive international endeavors for global change. Based on its historically good reputation and international standing, and having now joined the league of UNCLOS-ratified countries, Canada could then actively participate in, indeed lead the needed drive for change through a revision of aspects of the Law of the Sea.<sup>73</sup> While there are several issues that require attention and revision with regards to the LOS Convention and related instruments (including addressing the changing global security situation), the aspects I focus on here relate exclusively to living resource use. Given the arguments and issues presented earlier, Canada would be in a historically unique position to push for changing the fundamental legal framework away from the resource destructive and antiprecautionary *mare liberum* concept towards a global *mare reservarum*, centered on global ocean zoning with a central tenet of permanent no-take areas. Such an approach may have to be embedded in a context of global enforceability and accountability being assigned to distinct authorities with embedded legal and tribunal conflict resolution instruments, as was discussed earlier. In line with such reconceptualization, the effects of global climate change will have significant impacts on global Arctic waters, waterways, and resources, and these issues require serious international action.

Having ratified UNCLOS, and with an activated and funded Oceans Act, Species at Risk Act, and a revised Fisheries Act, Canada would be in a better position to place its marine ecosystems on a path towards sustainability. Such a focused engagement would allow future generations of Canadians to enjoy at least the same, but likely better, resource conditions than do present generations. Having taken these measures and initiatives, Canada would be ideally placed to ‘walk the talk,’ by taking a global leadership role in driving those changes in ocean resource use that are urgently required in the face of the global fisheries crisis.<sup>74</sup> The window of opportunity has opened for Canada; will it take up the challenge?

### CONCLUSIONS

Hugo Grotius, the father of international law gave us *mare liberum*, the freedom of the seas. For nearly 400 years, this concept has dominated our

73. Maritime Awards Society of Canada (n. 15 above).

74. Incidentally, in late 2003, Edward Greenspon, editor-in-chief of the Canadian national newspaper *The Globe and Mail*, wrote: “Canadians are very concerned about their role in the world. They badly want to be a nation that projects its values abroad—and makes a difference.” *The Globe and Mail*, 13 December 2003, p. A2. A sentiment, that increasingly goes beyond purely economic considerations, into social, human equality and environmental aspects.

approach to ocean use (open access, common property resources, etc.), and inevitably results in overexploitation, with little incentive to conserve. Over the last few decades, the world has slowly started to relinquish this notion, and is increasingly adopting a “heritage mindset.” However, declining global fisheries landings, ongoing fisheries management failures, damaging subsidies, and our lack of genuine understanding of how degraded marine ecosystems are (i.e., shifting baseline syndrome), illustrate that simply a change in mindset is insufficient. I suggest changing our fundamental governance framework defined as ocean use based on *mare liberum* to one of ocean care<sup>75</sup> based on *mare reservarum*, centered on limited spatial access for exploitation through large-scale ocean zoning within EEZs (national responsibility with international accountability) and outside of EEZs (international responsibility and accountability through appropriately empowered global institutions and instruments). Canada can be a global leader in this vision, with its Oceans Act of 1996 providing for ecosystem protection in Marine Protected Areas. However, half a decade later, little real progress seems to have been made. Even if implemented fully, the level of closures envisioned are likely insufficient to address overfishing and ecosystem degradation. In contrast, Australia’s Great Barrier Reef region (~350,000 km<sup>2</sup>) has had its level of no-take areas increase from less than 5 percent to 33 percent. This level of protection is highly desirable for ecosystem recovery and maintenance, essential precautionary ingredients for eventually reaching sustainability. Thus, a significant change in Canada’s approach to ocean resource use within the framework of the Oceans Act, towards that described by *mare reservarum*, will go a long way towards finally achieving sustainability. Beside decisive implementation of the Oceans Act and Strategy, Canada needs to significantly revise its Fisheries Act to bring it in line with modern principles of ecosystem-based management and precautionary approaches to resource use. Again, a revision of the Act, and application of precautionary, ecosystem principles such as provided for, inherently, by *mare reservarum*, would provide Canada with an integrated triumvirate of legal instruments (modified Oceans Act, revised Fisheries Act, Species at Risk Act) that could catapult Canada to the global forefront of visionary policy in ocean resource use for the 21st century. Clearly, a fundamental shift in attitude is called for by the global community. Societies and governments need to change the fundamental concepts underlying our use of the oceans. Canada did take tentative steps in this direction. It is time that we demand (on behalf of future generations) that Canada follows up on and extends its promises.

75. Rosenberg (n. 45 above).