Canada and the Precautionary Principle/Approach in Ocean and Coastal Management: Wading and Wandering in Tricky Currents

DAVID L. VANDERZWAAG,* SUSANNA D. FULLER**
AND RANSOM A. MYERS***

After reviewing the tricky nature of the precautionary principle/approach, such as confusion over terminology and the spectrum of precautionary measures available, the article through a four-part format describes Canadian initiatives and efforts to implement the precautionary principle/approach in ocean and coastal management. First, Canada's general steps to adopt the precautionary principle are discussed including caselaw developments and the limited embracing of precaution in environmental impact assessment review and strategic planning processes. Second, the paper reviews Canada's efforts to address marine pollution—ocean dumping, land-based, vessel-source and seabed activities—in light of precaution. Third, Canadian experiences with implementing precaution in the field of living marine resource management, including fisheries, aquaculture and biodiversity protection, are summarized. Fourth, Canada's rather non-precautionary responses to the threats of climate change are highlighted.

Canada's overall approach to the precautionary principle/approach is characterized in two images—wading and wandering. Canada has taken rather timid steps to implement the precautionary principle and, while strongly embracing precaution in the area of ocean dumping, has largely wandered towards general and weak versions.

Après avoir démontré la nature complexe du principe ou de l'approche de précaution, par exemple la confusion terminologique et la gamme des mesures de protection qui existent, l'article fait une description en quatre volets des initiatives et des efforts du Canada pour la mise en œuvre du principe ou de l'approche de précaution dans la gestion des océans et des côtes. D'abord, l'article examine les démarches générales prises par le Canada en vue de l'adoption du principe de précaution, y compris l'évolution de la jurisprudence et les effets d'une mise en œuvre étroite du principe de précaution sur le plan de l'évaluation et de la planification stratégique en contexte environnemental. Deuxièmement, l'article passe en revue les efforts du Canada pour régler la question de la pollution marine—rejet en mer, pollution d'origine tellurique, pollution due à la navigation et pollution résultant de l'exploration et de l'exploitation du fond marin—sous l'angle de la précaution. Troisièmement, l'article fait un compte rendu des expériences canadiennes de mise en œuvre de mesures de précaution relativement à la gestion des ressources marines vivantes, y compris les pêcheries, l'aquaculture et la protection de la biodiversité. Quatrièmement, l'article souligne la faible protection prévue par le Canada en matière des menaces que posent les changements climatiques.

Deux images illustrent la position générale du Canada en matière du principe ou de l'approche de précaution—le pataugeage et le voyage à l'aventure. Le Canada a pris quelques pas, bien timidement, en vue de la mise en œuvre du principe de précaution. Bien qu'il endosse fortement le principe de précaution en matière du rejet en mer, il est surtout allé à l'aventure vers des versions générales et sans grande vigueur.

* Professor, Dalhousie Marine and Environmental Law Programme. Professor VanderZwaag, the lead author, would like to acknowledge the Social Sciences and Humanities Research Council of Canada (SSHRC) for supporting his research on the roles of sustainable development principles and human rights norms in controlling toxic chemicals and the research assistance of Melanie MacLellan, and Anastasia Makrigiannis, Dalhousie Law School. Further research support was provided by AquaNet, a Centres of Excellence Network for Aquaculture in Canada, based at Memorial University, and funded by the Natural Sciences and Engineering Research Council of Canada and the SSHRC through Industry Canada. This paper was prepared for the Australian-Canadian Oceans Research Network (ACORN) II meeting in Canberra, Australia, May 31–June 2, 2002.

** Doctoral Candidate, Department of Biology, Dalhousie University.

*** Killam Chair in Ocean Studies, Dalhousie University.

Table of Contents

Canada and the Precautionary Principle/Approach in Ocean and Coastal Management: Wading and Wandering in Tricky Currents

DAVID L. VANDERZWAAG, SUSANNA D. FULLER AND RANSOM A. MYERS

1. Introduction: The Tricky Currents of Precaution

THE PRECAUTIONARY PRINCIPLE OR APPROACH, while firmly grounded in international environmental law,[1] fisheries law[2] and common sense,[3] may be likened to a life raft swirling in tricky currents. While the principle has great potential to save lives and salvage the environment by requiring anticipatory precautionary and preventative measures in the face of scientific uncertainty,[4] and by having a core notion of placing the burden of proof on those who propose change,[5] the principle is buffeted by political and practical implementation challenges.[6] Debate continues over terminology with some preferring the term precautionary approach because of its less onerous legal connotations.[7] Exactly what should trig-

---

1. Almost every recent international environmental agreement and declaration has included a version of the precautionary principle/approach. For a partial listing, see Carolyn Raffensperger & Joel A. Tickner, eds., *Protecting Public Health & the Environment: Implementing the Precautionary Principle* (Washington, D.C.: Island Press, 1999), at App. B.
2. See *e.g.* United Nations Food and Agriculture Organization, *Code of Conduct for Responsible Fisheries*, UN FAO, 28th Sess., (1995) at Article 7.5, online: United Nations Food and Agriculture Organization <http://www.fao.org/fi/agreem/codecond/codecon.asp>; *Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of 10 December 1982, Relating to the Conservation of Straddling Fish Stocks and Highly Migratory Fish Stocks*, 4 December 1995, 34 I.L.M. 1542 [*1995 UN Fish Stocks Agreement*]. See generally S.M. Garcia, "The Precautionary Principle: Its Implications in Capture Fisheries Management" (1994) 22 Ocean & Coastal Management 99; and Justin Cooke & Michael Earle, "Towards a Precautionary Approach to Fisheries Management" (1993) 2 R.E.C.I.E.L. 252.
3. Common sense sayings include: "an ounce of prevention is worth a pound of cure"; "a stitch in time saves nine"; and "if in doubt don't pump it out". David L. VanderZwaag, "The Precautionary Principle in Environmental Law and Policy: Elusive Rhetoric and First Embraces" (1998) 8 J. Evntl. L. & Prac. 355 at 358 ["Elusive Rhetoric"].
4. See Arie Trouwborst, *Evolution and Status of the Precautionary Principle in International Law* (The Hague: Kluwer Law International, 2002) at 10-11.
5. Andrew Jordan & Timothy O'Riordan, "The Precautionary Principle in Contemporary Environmental Policy and Politics" in Raffensperger & Tickner, *supra* note 1, 15 at 24.
6. For recent reviews of implementation challenges see David L. VanderZwaag, "The Precautionary Principle and Marine Environmental Protection: Slippery Shores, Rough Seas, and Rising Normative Tides" (2002) 33 Ocean Devel. & Int'l L. 165 ["Slippery Shores"]; and Christopher D. Stone, "Is There a Precautionary Principle?" (2001) 31 Environmental Law Reporter 10790.
7. For example, the Food and Agriculture Organization has preferred the term approach as it is "weaker" in meaning allowing considerations of cost-effectiveness and local capabilities. See *The Precautionary Approach to Fisheries with Reference to Straddling Fish Stocks and Highly Migratory Fish Stocks*, UN FAO, 1994, UN Doc. A/CONF.164/INF/8. This paper hereinafter will refer to both the precautionary approach and principle.

ger precautionary action remains controversial with the *Rio Declaration on Environment and Development* suggesting a threshold of "serious or irreversible" harm.[8] The extent the precautionary approach should be driven by "sound science" and risk assessment[9] versus social values and public perceptions is a further area of contention.[10] The *Rio Declaration* calls on states to apply the precautionary approach which leaves open the question as to which persons and institutions within states should be made responsible for making precautionary determinations and judgments.[11]

Tensions continue to exist over how extreme precautionary measures should be.[12] Extreme measures include: outright bans, phaseouts for risky chemicals or technologies and reversals in the burden of proof where the proponents of development activities would not be allowed to proceed unless they demonstrate lack of significant harm or some other standard of safety/acceptability.[13] Less extreme measures include, among others: requiring pollution prevention plans as a precondition to licensing polluting activities;[14] broadly applying environmental impact assessments, including alternatives assessments;[15] and ensuring strict or absolute liability approaches for pollution damage.[16]

---

8. *United Nations Conference on Environment and Development: Rio Declaration on Environment and Development*, 14 June 1992, 31 I.L.M. 874 at 879 [*Rio Declaration*]. Principle 15 of the *Rio Declaration* states:
   In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
9. What is meant by risk assessment may be the source of some debate. For a discussion of the need to move from traditional risk assessment seeking to quantify threats towards multidisciplinary risk assessment garnering wisdom from the natural and social sciences, see Nicolas de Sadeleer, *Environmental Principles in an Age of Risk: From Political Slogans to Legal Rules* (Oxford: Oxford University Press, 2002) at 180–95.
10. The role of risk assessment in risk management under uncertainty is a special area of divisiveness. For discussions, see Paul C. Lin-Easton, "It's Time for Environmentalists to Think Small—Real Small: A Call for the Involvement of Environmental Lawyers in Developing Precautionary Policies for Molecular Nanotechnology" (2001) 14 Geo. Int'l Envtl. L. Rev. 107 at 128-29; Kenneth R. Foster, Paolo Vecchia & Michael H. Repacholi, "Risk Management: Science and the Precautionary Principle" (2000) 288 Science 979; and Wybe Douma, "The Precautionary Principle in the European Union" (2000) 9 R.E.C.I.E.L. 132 at 142.
11. For a recent call for an independent regulatory authority to broaden precautionary discourse about new biotechnology, see William Leiss & Michael Tyshenko, "Some Aspects of the 'New Biotechnology' and its Regulation in Canada" in Debora L. VanNijnatten & Robert Boardman, eds., *Canadian Environmental Policy: Context and Cases*, 2d ed. (Don Mills, Ont.: Oxford University Press Canada, 2002) 321.
12. For reviews of the spectrum of regulatory responses and strategies, see John S. Applegate, "The Precautionary Preference: An American Perspective on the Precautionary Principle" (2000) 6 Human and Ecological Risk Assessment 413 at 415–16; Joel A. Tickner, "A Map Toward Precautionary Decision Making" in Raffensperger & Tickner, *supra* note 1, 162 at 171–72; and Adrian Deville & Ronnie Harding, *Applying the Precautionary Principle* (Sydney: Federation Press, 1997).
13. See Carl F. Cranor, "Asymmetric Information, The Precautionary Principle, and Burdens of Proof" in Raffensperger & Tickner, *supra* note 1, 74 at 93–94.
14. VanderZwaag, "Slippery Shores", *supra* note 6 at 168.
15. See Mary O'Brien, "Alternatives Assessment: Part of Operationalizing and Institutionalizing the Precautionary Principle" in Raffensperger & Tickner, *supra* note 1, 207 at 208. Alternatives assessment involves public examination of a full range of alternatives to a potentially damaging human activity and includes the fundamental question of whether a potentially hazardous activity is necessary and what less hazardous options are available.
16. See Bruce Pardy, "Applying the Precautionary Principle to Private Persons: Should It Affect Civil and Criminal Liability?" (2002) 43 C. de D. 63.

In the fisheries management field, a broad array of precautionary measures are also available. Proponents of new fisheries might be required to demonstrate no significant ecological damage or to meet some other legal litmus test before license approval. Other measures include: ensuring that all discards are quantified and incorporated into estimates of fishing mortality;[17] ensuring that fish spawn at least once, so that all fish contribute to the population before being harvested;[18] limiting a fishery by the catch of a non-target species (*e.g.* the pollock fishery in Alaska is shutdown once a specific amount of halibut is caught);[19] conducting environmental assessments of fishing gear and managing according to the level of harm each gear risks within the concept of ecosystem management; developing gear zoning legislation;[20] eco-labelling of fish—providing a market based incentive for precautionary management and fishing practices;[21] and following adaptive management processes where decisions can be flexible based on the outcome of regulated measures.

The precautionary principle, at least in extreme versions, has been greeted with considerable skepticism.[22] The principle has been perceived as potentially blocking technological progress including the benefits of new genetically modified organisms.[23] It has also been accused of undermining legal certainty by providing bureaucrats wide discretion to change the rules of the game.[24]

International legal and institutional arrangements to date have largely failed to work out the operational details of precaution. The only sector where a

---

17. See Heather Breeze, *Conservation Lost at Sea: Discarding and Highgrading in the Scotia-Fundy Groundfishery in 1998* (Halifax: Ecology Action Centre and Conservation Council of New Brunswick, 1998) at 15; and Ransom A. Myers, Susanna D. Fuller & Daniel G. Kehler, "A Fisheries Management Strategy Robust to Ignorance: Rotational Harvest in the Presence of Indirect Fishing Mortality" (2000) 57 Can. J. Fish Aquat. Sci. 2357.
18. See Gordon Mertz & Ransom A. Myers, "A Simplified Formulation for Fish Production" (1998) 55 Can. J. Fish Aquat. Sci. 478.
19. U.S., International Pacific Halibut Commission, *The Pacific Halibut: Biology, Fishery, and Management* (Technical Report No. 40) (Seattle, Wash.: International Pacific Halibut Commission, 1998).
20. Gear assessments have been conducted in the United States by the National Oceanographic and Atmospheric Association. See U.S., National Oceanic and Atmospheric Administration, Department of Commerce, *A Review of the Fishing Gear Utilized Within the Southeast Region and Their Potential Impacts on Essential Fish Habitat* (NOAA Technical Memorandum NMFS-SEFSC-449) by Michael C. Barnette (St. Petersburg, Fl.: National Marine Fisheries Services, 2001) at 62.
21. Online: Marine Stewardship Council <http://www.msc.org/>. The Marine Stewardship Council has developed criteria for certification of fisheries. This endeavour began as a partnership between World Wildlife Fund and Unilever, one of the world's largest fish companies. No fisheries were certified in Canada as of May 2002 and six fisheries were certified globally.
22. The battle of worldviews or narratives underlying the salvatory or skeptical viewpoints towards precaution may be described in various ways including: Frankenstein vs. Better Living Through Chemistry; prohibitory vs. regulatory mindsets; and deep green vs. light / shallow green visions. See respectively John S. Applegate, "The Prometheus Principle: Using the Precautionary Principle to Harmonize the Regulation of Genetically Modified Organisms" (2001) 9 Ind. J. Global Legal Stud. 207 ["Prometheus Principle"]; Douglas M. Johnston & David L. VanderZwaag, "The Ocean and International Environmental Law: Swimming, Sinking, and Treading Water at the Millennium" (2000) 43 Ocean & Coastal Management 141 at 152; and Judith I. McKenzie, *Environmental Politics in Canada: Managing the Commons into the Twenty-First Century* (Don Mills, Ont.: Oxford University Press Canada, 2000) at 13–38. A further description is trial without error versus trial and error. See Aaron Wildavsky, "Trial and Error Versus Trial Without Error" in Julian Morris, ed., *Rethinking Risk and the Precautionary Principle* (Oxford: Butterworths-Heinemann, 2000) 22.
23. See *e.g.* Julian Morris, "Defining the Precautionary Principle" in Morris, *ibid.*, 1 at 17–18.
24. *Ibid.* at 18–19.

direct and strong precautionary vision has been operationalized is in ocean dumping where the *1996 Protocol*[25] *to the London Convention of 1972*[26] calls for a precautionary "reverse listing" approach where only wastes listed on a "safe list" may be disposed of at sea[27] and only after government regulators require a waste assessment.[28] The control of toxic and hazardous chemicals might be described as quite non-precautionary with the *1998 Rotterdam Convention*[29] continuing to allow trade in banned or severely restricted chemicals subject to a prior informed consent procedure.[30] Only a "dirty dozen" chemicals are initially being targeted under the *Stockholm Convention on Persistent Organic Pollutants* for phase out or elimination.[31] Relatively few heavy metals and toxic chemicals are subject to regional controls.[32] The global community has not yet been able to agree on common precautionary standards for the plethora of land-based activities.[33] Working out the details of precaution in fisheries management has been largely delegated to regional fish-

---

25. *Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Conference), 1972: Final Act, 1996 Protocol and Resolutions*, 1 November 1996, 36 I.L.M. 1 [*1996 Protocol to the London Convention of 1972*].
26. *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter*, 29 December 1972, 1046 U.N.T.S. 120, 11 I.L.M. 1291 [*London Convention of 1972*].
27. Those wastes include: dredged material; fish wastes; ships, aircraft, platforms and other structures to the extent they do not pose a serious obstacle to fishing or navigation; inert, inorganic geological matter; uncontaminated organic matter of natural origin; and bulky substances primarily composed of iron, steel, concrete or other similar matter that do not have a significant adverse effect.
28. *Supra* note 25. The *1996 Protocol to the London Convention of 1972* calls upon countries to require ocean disposal applicants to undertake waste prevention audits and to develop waste prevention strategies before permit issuance.
29. *Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade*, 11 September 1998, 38 I.L.M. 1 (not yet entered into force) [*1998 Rotterdam Convention*].
30. The *1998 Rotterdam Convention*, *ibid.*, being implemented on an interim basis until entry into force, covered 31 chemicals as of June 2002. See Interim Secretariat for the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, *PIC Circular XV of June 2002*, UNEP, 2002, online: PIC Rotterdam Convention <http://www.pic.int/en/Circular/CIRC15EN.pdf>. For a further discussion, see David L. VanderZwaag, Rob Huebert & Stacey Ferrara, "The Arctic Environmental Protection Strategy, Arctic Council and Multilateral Initiatives: Tinkering While the Arctic Marine Environment Totters" (2002) 30 Denv. J. Int'l L. & Pol'y 131 at 159.
31. *Stockholm Convention on Persistent Organic Pollutants*, 22 May 2001, 40 I.L.M. 532 (not yet entered into force). The *Convention* stands out as reactive rather than proactive in nature by targeting a limited list of well-known persistent and bioaccumulative substances falling into three categories: 1) pesticides: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene; 2) industrial chemicals: hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs); and 3) unintended byproducts: dioxins and furans. The *Convention*, art. 8(9) calls upon the Conference of the Parties to decide in a precautionary manner whether to list additional chemicals.
32. See *1979 Convention on Long-Range Transboundary Air Pollution and Its 1998 Protocols on Persistent Organic Pollutants and Heavy Metals*, UN ECE, 1999, UN Doc. ECE/EB.AIR/66. Pursuant to this *Convention*, countries under the regional umbrella of the UN Economic Commission for Europe in 1998 adopted a heavy metals protocol addressing just three heavy metals—cadmium, lead and mercury—and a POPs protocol initially targeting only 16 substances. For a critical review, see David L. VanderZwaag, "Regionalism and Arctic Marine Environmental Protection: Drifting between Blurry Boundaries and Hazy Horizons" in Davor Vidas & Willy Østreng, eds., *Order for the Oceans at the Turn of the Century* (The Hague: Kluwer Law International, 1999) c. 17 at 244-46 ["Arctic Marine Environmental Protection"].
33. For a critique of global efforts to address land-based marine pollution, see David L. VanderZwaag, Peter G. Wells & John Karau, "The Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities: A Myriad of Sounds, Will the World Listen?" (1998) 13 Ocean Yearbook 183.

eries organizations and national levels.[34] The *Cartagena Protocol on Biosafety*[35] allows parties to prohibit the import of living modified organisms under domestic regulatory frameworks in accord with the precautionary approach. However, whether a risk assessment is necessary before a country decides to prohibit imports of living modified organisms intended for direct use as food, feed or for processing is left uncertain.[36]

In light of the controversial and elusive nature of the precautionary approach, the eventual "firming up" of precaution will likely depend largely on national law and policy efforts. This paper summarizes, through a four-part format, Canadian initiatives and efforts to implement the precautionary approach. Section II describes Canada's general steps to adopt the precautionary approach including: the *1998 Canada-wide Accord on Environmental Harmonization*;[37] the Government of Canada *Discussion Document* on the precautionary approach/principle released in 2001;[38] the Environment Canada-Health Canada Workshop on the Precautionary Approach in March 2002;[39] and case law developments relating to precaution.[40] The section concludes with a brief look at the limited embracing of precaution in environmental impact assessment review and strategic planning processes. Section III reviews Canada's efforts to address marine pollution—ocean dumping, land-based, vessel-source and seabed activities—in light of precaution. Section IV examines Canadian experiences with implementing precau-

---

34. See Jaye Ellis, "The Straddling Stock Agreement and the Precautionary Principle as Interpretive Device and Rule of Law" (2001) 32 Ocean Devel. & Int'l L. 289; S.M. Garcia, "The Precautionary Approach to Fisheries: Progress Review and Main Issues (1995-2000)" in M.H. Nordquist & J.M. Moore, eds., *Current Fisheries Issues and the Food and Agriculture Organization* (The Hague: Martinus Nijhoff Publishers, 2000) at 479.

35. *Cartagena Protocol on Biosafety to the Convention on Biological Diversity*, 29 January 2000, 39 I.L.M. 1027 (not yet entered into force) [*Cartagena Protocol on Biosafety*].

36. The *Cartagena Protocol on Biosafety*, *ibid.*, while clearly requiring a risk assessment before import prohibitions on living modified organisms (LMOs) intended for intentional introductions into the environment of the Party of import, leaves some uncertainty over whether a risk assessment is necessary to justify import prohibitions on LMO foods or feeds. The Protocol expresses an intention in the preamble to be supportive of trade agreements and thus the door is opened for argument that a risk assessment should be required. See *e.g.* Peter-Tobias Stoll, "Controlling Risks of Genetically Modified Organisms: The Cartagena Protocol on Biodiversity and the SPS Agreement" (1999) 10 Y.B. Int'l Env. L. 82; Jonathan H. Adler, "More Sorry than Safe: Assessing the Precautionary Principle and the Proposed International Biosafety Protocol" (2000) 35 Tex. Int'l L.J. 173 at 193; Sean D. Murphy, "Biotechnology and International Law" (2001) 42 Harv. Int'l L.J. 47 at 78-87. For discussions of risk assessment requirements under the Sanitary and Phytosanitary Standards Agreement and the North American Free Trade Agreement, see James Cameron & Karen Campbell, "A Reluctant Global Policymaker" in Richard H. Steinberg, ed., *The Greening of Trade Law* (Lanham, Md.: Rowman & Littlefield, 2002) 23; Julie A. Soloway, "The North American Free Trade Agreement: Alternative Models of Managing Trade and the Environment" in Steinberg (*ibid.* at 155).

37. Canadian Council of Ministers of the Environment, *A Canada-wide Accord on Environmental Harmonization* (Winnipeg: CCME Publications, 1998) [*Harmonization Accord*], online: Canadian Council of Ministers of the Environment <http://ccme.ca/assets/pdf/accord_harmonization_e.pdf>.

38. Environment Canada, *A Canadian Perspective on the Precautionary Approach/Principle: Discussion Document* (Ottawa: Environment Canada, 2001) [*Discussion Document*], online: Environment Canada <http://www.ec.gc.ca/econom/pp_e.htm>.

39. Environment Canada-Health Canada Workshop, *Workshop on the Government of Canada's Discussion Document on the Precautionary Approach/Principle and Its Application to CEPA 1999* (Ottawa: 20 March 2002) [*Environment Canada-Health Canada Workshop*].

40. For a general review of case law developments relating to precaution see Elizabeth Fisher, "Is the Precautionary Principle Justiciable?" (2001) 13 J. Envtl. L. 315.

tion in the field of living marine resource management including fisheries, aquaculture and biodiversity protection. Finally, Section V highlights Canada's rather non-precautionary responses to the threats of climate change.

II. Canadian General Steps and Wanderings

A. ENVIRONMENTAL HARMONIZATION ACCORD

Adopted on January 29, 1998 by the Canadian Council of Ministers of the Environment (with the exception of Quebec), the *Harmonization Accord* pledges governments to cooperate in establishing consistent environmental measures, to prevent inter-jurisdictional disputes and to apply common environmental management principles. Besides recognizing such principles as polluter pays, pollution prevention, public participation and Aboriginal rights, the *Harmonization Accord* expressly adopts the precautionary principle:

> [W]here there are threats of serious or irreversible environmental damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation....[41]

Sub-agreements developed under the *Harmonization Accord*[42] might be described as "cautious wadings" as the precautionary principle is not strongly embraced. The *Sub-agreement on Canada-wide Environmental Standards*,[43] while expressly repeating commitment to the precautionary principle,[44] dilutes the commitment through various qualifications, such as the statements that standards to be developed will be based on "sound science"[45] and that environmental measures will be determined in a sustainable development context recognizing "socio-economic considerations."[46] The *Sub-agreement on Environmental Assessment*,[47] aimed at avoiding duplication in project assessments through designation of a lead party responsible for administering the assessment process, avoids express mention of the precautionary principle in favour of highlighting other principles—effectiveness, transparency, public accountability, efficiency and certainty.[48]

Canadian provinces have been slow to adopt the precautionary principle in legislation. Only one province—Nova Scotia—has expressly adopted the precau-

---

41. *Supra* note 37, Principle 2.
42. Three sub-agreements were adopted in January 1998 in the areas of inspections, standards and environmental assessment; Canadian Council of Ministers of the Environment, *Inspections and Enforcement Sub-agreement* (Winnipeg: CCME Publications, 1998) [*Sub-agreement on Inspections and Enforcement*], online: Canadian Council of Ministers of the Environment <http://www.ccme.ca/assets/pdf/insp_enfsubagr_e.pdf>; Canadian Council of Ministers of the Environment, *Sub-agreement on Environmental Assessment* (Winnipeg: CCME Publications, 1998) [*Sub-agreement on Environmental Assessment*], online: Canadian Council of Ministers of the Environment <http://www.ccme.ca/assets/pdf/evntlassesssubagr_e.pdf>; Canadian Council of Ministers of the Environment, *Canada-wide Environmental Standards Sub-agreement* (Winnipeg: CCME Publications, 1998) [*Sub-agreement on Canada-wide Environmental Standards*], online: Canadian Council of Ministers of the Environment <http://www.ccme.ca/assets/pdf/cws_envstandards_subagreement.pdf>.
43. *Sub-agreement on Canada-wide Environmental Standards*, *ibid.*
44. *Ibid.*, Principle 3.1.3.
45. *Ibid.*, Principle 3.1.2.
46. *Ibid.*, Principle 3.1.7
47. *Supra* note 42.
48. *Ibid.* at section 3 (Principles).

tionary approach in general environmental protection legislation.[49] Very few sectoral pieces of provincial legislation, such as clean air legislation, have been amended to incorporate the precautionary approach.[50]

B. GOVERNMENT OF CANADA DISCUSSION DOCUMENT

In September 2001, the Government of Canada issued a *Discussion Document* on the precautionary approach/principle, prepared through a multi-departmental approach,[51] to suggest guiding principles for operationalizing precaution and to gauge the reaction of stakeholders.[52] As a step toward building consensus on the establishment of a Canadian federal framework for applying the precautionary approach, the document proposes "guiding principles".[53] The first six involve general principles of application, for example: recognizing the legitimacy for decisions to be guided by a society's chosen level of protection against risk; suggesting sound scientific information must be the basis for applying the precautionary approach; and noting the importance of increased transparency, accountability and public involvement.

The last five principles focus on precautionary measures and suggest precautionary measures should be:

· Subject to reconsiderations based on the evolution of science, technology and society's chosen level of protection;

· Proportional to the potential severity of the risk being addressed and to society's chosen level of protection;

· Non-discriminatory and consistent with measures taken in similar circumstances;

· Cost-effective, with the goal of generating an overall net benefit for society at least cost and efficiency in the choice of measures; and

· Least trade restrictive.

While various critiques of the *Discussion Document* are available,[54] its three most fundamental limitations are: attempting to furl the sails of precaution through a "sound science" limitation; failing to clearly address the burden of proof in decision-making; and neglecting the important approach of alternatives assess-

---

49. Nova Scotia's *Environment Act*, S.N.S. 1994-95, c. 1, s. 2(b)(ii) provides: "the precautionary principle will be used in decision-making so that where there are threats of serious or irreversible damage, the lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation...."
50. One of the few examples is New Brunswick: *Clean Air Act*, S.N.B. 1997, c. C-5.2 which in its purpose section advocates a precautionary approach to air pollution control.
51. *Supra* note 38 at Foreword. Involved in preparing the *Discussion Document* were Agriculture and Agrifood Canada, Canadian Environmental Assessment Agency, Canadian Food Inspection Agency, Department of Fisheries and Oceans, Department of Foreign Affairs and International Trade, Environment Canada, Finance Canada, Health Canada, Industry Canada, Justice Canada, Natural Resources Canada, Privy Council Office, Transport Canada and Treasury Board Secretariat.
52. *Ibid.* at Part 6 (Websites). The *Discussion Document* was posted on the websites of various departments and feedback was invited from interested persons.
53. *Ibid.* at Part 3 (Guiding Principles: General Principles of Application).
54. See *e.g.* the timed discussion by the Ocean Management Research Network (OMRN) on the *Discussion Document* involving three panelists' perspectives, online: Ocean Management Research Network <http://www.omrn.ca>; Hugh Benevides & Theresa McClanaghan, *Implementing Precaution: An NGO Response to the Government of Canada's Discussion Document* (Toronto: Canadian Environmental Law Association, 2002).

ment. Perhaps the most important limitation is the attempt in Principle 3.3 to restrict application of the precautionary approach to situations where there is adequate scientific information and evaluation. Principle 3.3 reads, "Sound scientific information and its evaluation *must be* the basis for applying the precautionary approach...."[55] The accompanying commentary reinforces the need for risk assessment:

> Before the precautionary approach can be applied, scientific data relevant to the risk must be evaluated through a sound, credible, transparent and inclusive mechanism leading to a conclusion that expresses the possibility of occurrence of harm and the magnitude of that harm ....[56]

Sound scientific information is *not* essential for applying the precautionary approach. For example, a precautionary "reverse listing" approach may be based on a societal judgment as to acceptable risk. With such an approach, certain chemicals might be prohibited from use until an adequate risk assessment has been undertaken.

An example of the "reverse listing" approach is seen in the *1996 Protocol to the London Convention 1972* where only those wastes listed on a "safe list" will be allowed to be dumped at sea (pursuant to a permit).[57] In the field of ocean disposal, sound scientific evaluation is *not* the basis for the overall precautionary approach.

The hinging of precaution on risk assessment also runs counter to the spirit of the *1995 UN Fish Stocks Agreement*.[58] Article 6(2) of the *Agreement* reads:

> States shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.

A second major limitation is the restricted treatment of the burden of proof. The Legal Issues section of the *Discussion Document* notes the effect of codifying the precautionary approach in statute may be to shift the burden of proof on those who propose change to show the proposed activity will not cause serious environmental harm.[59] However, the *Discussion Document* fails to recommend as a guiding principle general burden of proof reversal. Instead, in Principle 3.4, it restricts the burden of proof to the issue of who should bear the burden of producing scientific information.[60] The document suggests the responsibility for providing the scientific information base should generally rest with the party taking action associated to the potential or serious harm, but that burden may shift depending on who in a concrete scenario would be in the best position to provide the information base.

A third limitation is neglecting the important approach of alternatives assessment. While risk assessment may be a useful tool in understanding risk, an

---

55. *Supra* note 38 at Principle 3.3 [emphasis added].
56. *Ibid.*
57. *Supra* note 25.
58. *Supra* note 2 at 1551.
59. *Supra* note 38 at Legal Issues section.
60. *Ibid.* at Principle 3.4.

increasing number of academic writers are urging greater use of "alternatives assessment."[61] Under such an approach, decision-makers are encouraged to consider alternative technologies, locations, timings and scales with the objective of identifying least environmentally intrusive options.

C. ENVIRONMENT CANADA–HEALTH CANADA WORKSHOP

On March 20, 2002, Environment Canada, in collaboration with Health Canada, hosted a national workshop, involving over 60 participants from government, industry, labour, non-governmental organizations, academia and consultants, to capture views on the *Discussion Document* and to discuss how the Guiding Principles apply to the *Canadian Environmental Protection Act, 1999*.[62] The Workshop showed a deep division of opinions particularly over the appropriate role of risk assessment and who should bear the burden of proof.[63] For example, a representative from a major oil company argued that the burden to establish a threat of serious or irreversible harm should be on the party alleging harm, and asserted government should only apply the precautionary approach in the context of science-based decision-making where there must be a "real" scientifically-based "threat". In contrast, a representative from the Canadian Environmental Law Association emphasized that the proponent of an activity, rather than the public, should bear the burden of proof and rejected the notion that the precautionary principle is simply an element of a risk assessment-risk management approach.

Various limitations in the *Discussion Document* were identified by participants. Those limitations include not addressing how protection of children and other vulnerable groups should influence precaution, not linking the precautionary principle with the other principles, such as pollution prevention and intergenerational equity, and not recognizing the central role of social preferences and moral considerations in determining precautionary measures.

D. CANADIAN CASE LAW

Although case law treatment of the precautionary approach in Canada has not been extensive,[64] with judges and tribunals generally avoiding detailed jurispru-

---

61. See Mary O'Brien, *Making Better Environmental Decisions: An Alternative To Risk Assessment* (Cambridge: MIT Press, 2000).
62. Stratos Inc., "Discussion Paper for the March 20 2002 Workshop on the Precautionary Principle" (Paper Presented to the Workshop on the Government of Canada's Discussion Document on the Precautionary Approach/Principle and its Application to CEPA 1999, March 2002) [unpublished]. See also *Canadian Environmental Protection Act, 1999*, S.C. 1999, c. 33 [*CEPA, 1999*].
63. David L. VanderZwaag, one of the authors, participated in the Workshop and the following summary is based on his personal notes.
64. For a good overview of cases, see Julie Abouchar, "Implementation of the Precautionary Principle in Canada" in Timothy O'Riordan, James Cameron & Andrew Jordan, eds., *Reinterpreting the Precautionary Principle* (London: Cameron, 2001) 235 at 245-51.

dential discussion,[65] the Supreme Court of Canada has opened the net for citizens and environmental groups displeased with decisions inadequately considering the precautionary approach to seek judicial review. In *Spraytech v. Town of Hudson*,[66] the Court recognized that the precautionary principle is part of international law[67] and relied on the principle for justifying a broad interpretation of provincial statutory authority allowing towns to regulate pesticides through by-laws under the rubric of preventive action. The Court, in upholding the Town of Hudson's by-law restricting non-essential uses of pesticides, restated the potential importance of international legal principles in not only statutory interpretation but also in assessing the reasonableness of discretionary administrative decisions. Justice L'Heureux-Dubé reemphasized the wave-making language from *Baker v. Canada (Minister of Citizenship & Immigration)*: "...the values reflected in international human rights law may help to inform the contextual approach to statutory interpretation and judicial review."[68]

An area of untested waters is the potential for environmental advocates to combine precautionary arguments with other normative currents of international law, such as the right of children to a healthy environment,[69] evolving indigenous rights to environmental protection[70] and the emerging human right to a healthy environment.[71] Such synergizing might provide a basis for invoking strong versions of precaution, such as reversing the burden of proof in decision-making processes and forcing consideration of pollution prevention alternatives.[72]

A key case, *Ecology Action Centre Society v. Attorney General of Canada*,[73] presently before the Federal Court of Canada, raises the precautionary principle

---

65. The precautionary approach has been involved rather summarily in various ways including: as a basis for upholding a wildlife manager's conservative setting of license quotas for hunting grizzly bears (*Gutfrucht v. British Columbia (Ministry of Environment, Lands and Parks)* [1999] B.C.E.A. No. 27 (British Columbia Environmental Appeal Board) (QL, B.C.E.A.)); as an anticipatory approach to deeming dense smoke a public nuisance (*Rousseau v. McNab-Braeside (Township of)* (2002, 25 M.P.L.R. (3d) 267, O.T.C. 900 (Ont. Sup. Ct. J.) [QL, OJ)); as a reason for giving a broad right of appeal (*Thompson v. Ontario (Ministry of the Environment)* [1998] O.E.A.B. No. 23 (Ontario Environmental Appeal Board) (QL, O.E.A.B.)); and as a rationale for only allowing pesticide applications as a "last resort" and under strict application conditions (*Ash (Re)* (1998), 26 C.E.L.R. (N.S.) 227 (Alberta Environmental Appeal Board (QL, A.E.A.B.D.)).

66. Indexed as *114957 Canada Ltée (Spraytech, Societé d'arrosage) v. Hudson (Town of)*, [2001] 2 S.C.R. 241, 200 D.L.R. (4th) 419 [*Spraytech* cited to S.C.R.]. For reviews of the decision, see Marcia Valiante, "Turf War : Municipal Powers, The Regulation of Pesticides and the *Hudson* Decision" (2002) 11 J. Envtl. L. & Prac. 325.; and Howard Epstein, "Case Comment: *Spraytech v. Town of Hudson*", Case Comment, (2001), 19 M.P.L.R. (3d) 56. For a discussion of the lower court rulings and the legal issues raised, see John Swaigen, "The *Hudson* Case: Municipal Powers to Regulate Pesticides Confirmed by Quebec Courts", Case Comment, (2000), 34 C.E.L.R. (N.S.) 162.

67. The Court indicated there may be sufficient state practice to establish the precautionary principle as a principle of customary international law; see *ibid.* at para. 32.

68. [1999] 2 S.C.R. 817 at 861, 174 D.L.R. (4th) 193 at 231.

69. See *e.g.* Malgosia Fitzmaurice, "The Right of the Child to a Clean Environment" (1999) 23 S. Ill. U.L.J. 611.

70. For a review of the evolving regime of indigenous rights, see Dalee Sambo Dorough, "Indigenous Peoples and the Law of the Sea: The Need for a New Perspective" in Vidas & Østreng, *supra* note 32, 407 at 412–15.

71. See John Lee, "The Underlying Legal Theory to Support a Well-Defined Human Right to a Healthy Environment as a Principle of Customary International Law" (2000) 25 Colum. J. Envtl. L. 283.

72. For a further discussion of this likely development, see VanderZwaag, "Slippery Shores", *supra* note 6.

73. See Ecology Action Centre and Sierra Legal Defence Fund, Media Release, "Lawsuit Launched to Protect Fish Habitat from Destructive Draggers" (4 July 2001).

in the context of fisheries and marine environmental protection. The Ecology Action Centre, located in Halifax, Nova Scotia, and represented by legal counsel from the Sierra Legal Defence Fund, is challenging the legality of the Regional Director-General's Variation Order under the *Fisheries Act*[74] allowing draggers to fish on Georges Bank. The application for judicial review alleges that the issuance of fishing authority is contrary to section 35(1) of the *Fisheries Act,* which prohibits the harmful alteration, disruption or destruction of fish habitat. The applicant is also arguing that harmful alteration of fish habitat by draggers has not been authorized pursuant to the *Fisheries Act* and has not been subjected to environmental impact assessment under the *Canadian Environmental Assessment Act*.[75] The applicant has given notice of intent to rely on the precautionary principle but detailed arguments have yet to be developed.[76]

The case of *Brighton v. Nova Scotia (Minister of Agriculture and Fisheries)*[77] dealt with a citizen challenge, partly based on the precautionary approach, to a ministerial decision in favour of licensing a finfish net cage aquaculture farm in Northwest Cove, Nova Scotia. There, a group of concerned citizens argued that the Minister had failed to err on the side of caution in light of so many unanswered questions regarding environmental consequences of the proposal. The appellants referred to the precautionary approach called for under Canada's *Oceans Act* in section 30 and the preamble.[78] While Justice MacDonald agreed that the Minister was under a duty to proceed cautiously, whether legislatively directed or not, he found the Minister in fact had proceeded cautiously in light of stringent license conditions and ongoing monitoring requirements.

The case demonstrates some of the potential difficulties those challenging administrative decisions in light of the precautionary approach may face. Where natural resource legislation provides broad licensing discretion, and even favours economic development, judges are likely to be highly deferential.[79] Courts may also be hesitant to address reversal in the burden of proof given traditional faith in bureaucratic expertise.

E. ENVIRONMENTAL ASSESSMENT AND STRATEGIC PLANNING

While environmental impact assessment processes may be viewed as inherently precautionary by supporting anticipatory and preventative planning,[80] laws and practices at both the provincial and federal levels have not strongly embraced the precautionary approach. Neither provincial nor federal environmental assess-

74. R.S.C. 1985, c. F-14.
75. S.C. 1992, c. 37 [*CEAA*].
76. Personal communication, Raymond MacCallum, Legal Counsel, Sierra Legal Defence Fund (13 May 2002).
77. (2002), 206 N.S.R. (2d) 95, 645 A.P.R. 95 (S.C.) [*Brighton* cited to N.S.R].
78. *Ibid.* at para. 44.
79. *Ibid.* at para. 34. In *Brighton*, MacDonald J. suggested at least reasonableness simpliciter, if not patent unreasonableness, was the appropriate standard of review.
80. See Warwick Gullett, "The Precautionary Principle in Australia: Policy, Law & Potential Precautionary EIAs" (2000) 11 Risk: Health, Safety & Environment 93 at 117.

ment laws make explicit reference to the precautionary principle.[81] The *CEAA*[82] may be criticized for various "non-precautionary" aspects, including: the largely self-assessing approach where the federal department or agency that is the proponent, funder, regulator or grantor of a land interest is responsible for assessments and final decisions;[83] the limitation to project proposals and failure to include assessment of government policies, programs and plans;[84] the limits of public participation particularly at the screening stage of review[85] where public comment is discretionary and participant funding is not ensured;[86] the lack of decision criteria;[87] and the wide discretion left to responsible authorities to require monitoring programs.[88] The *CEAA* has also been criticized for not requiring alternatives to proposed projects to be addressed.[89]

Bill C-9, *An Act to amend the Canadian Environmental Assessment Act*, was before the House of Commons at the time of writing[90] but the proposed amendments leave many deficiencies.[91] The amendments in their present form do not

---

81. Nova Scotia's *Environment Act*, *supra* note 49, does adopt the precautionary principle in its purpose section but not in the substantive provisions governing the environmental impact assessment process itself in Part IV.
82. *Supra* note 75.
83. S. 5.
84. Canadian Environmental Assessment Agency, *Strategic Environmental Assessment, 1999 Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals* (Quebec: Canadian Environmental Assessment Agency, 2000) This directive has adopted a flexible approach to such assessment with public participation not ensured and limited coverage to plans, policies and programs raising significant environmental concern and subject to Cabinet or Ministerial approval. It has been described as lacking transparency and being widely ignored. See Robert B. Gibson, "The Major Deficiencies Remain: A Review of the Provisions and Limitations of Bill C-19, an Act to Amend the *Canadian Environmental Assessment Act*" (2001) 11 J. Envtl. L. & Prac. 83 at 101.
85. Canadian Environmental Assessment Agency, *Performance Report for the Period Ending March 31, 2000* (Ottawa: Minister of Public Works and Government Services Canada, 2000) at 31. While the *CEAA* provides for other types of assessment, namely, comprehensive studies, panel reviews and possibly mediation, some 99% of assessments are limited to screening review. For example, during the 1999-2000 period, 5,662 screenings were initiated compared to nine comprehensive studies and three panels
86. *Supra* note 75, s. 58(1.1). Participant funding is limited to mediations and review panel assessments.
87. S. 4 (Purpose Section). The *CEAA* simply encourages "responsible authorities to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy." In s. 37, the *CEAA* leaves wide discretion for decision-makers to allow questionable projects to proceed by open-textured determinations such as "not likely to cause significant adverse environmental effects" and "mitigation measures", but the most serious "loophole" may be the authority for responsible authorities to even allow projects likely to cause significant adverse effects to proceed if "they can be justified in the circumstances" (*ibid.*, ss. 37, 37(1)(a)(ii)). "Justified" is not defined under the Act, and although pursuant to s. 58(1)(a) the Minister of Environment is authorized to develop criteria for determining justification, no such criteria have been developed.
88. S. 38. Responsible authorities are given considerable discretion as to the nature of follow-up programs since specific regulations governing monitoring details have not been issued.
89. See Shauna Finlay, "Sustainable Development and the *Canadian Environmental Assessment Act*" (1999) 8 J. Envtl. L. & Prac. 377 at 385-86. S. 16 of the *CEAA* provides responsible authorities discretion to require consideration of the need for the project and alternatives to the project. For comprehensive studies, review panel reviews and mediations, an assessment of *alternative means* of carrying out the project is required not a comprehensive alternatives assessment.
90. Bill C-9, *An Act to amend the Canadian Environmental Assessment Act*, 2d Sess., 37th Parl., 2002. The bill was originally introduced in the 1st session of the 37th Parliament as Bill C-19 but died on the *Order Paper* when Parliament was prorogued on 16 September 2002. The bill was reintroduced in the 2d session as Bill C-9 with First Reading before the House of Commons designated as 9 October 2002.
91. For a comprehensive review, see Gibson, *supra* note 84.

include reference to the precautionary principle and still do not bring strategic assessment of government plans, programs and policies under a legislative umbrella. The amendments promise to continue the largely self-assessing process by federal departments and agencies with no independent powers granted to the Minister of Environment to set terms and conditions for approval. Public involvement at the screening stages of assessment would still be discretionary,[92] and explicit criteria for decision-making are not provided.[93]

While environmental assessment legislation itself does not explicitly mandate the precautionary approach, various review panels have in practice addressed precaution either because of participant arguments or by direction in terms of reference. For example, in the joint federal-provincial assessment of Nova Scotia Sable Gas Projects, some intervenors argued that the precautionary principle should be used to impose zero-discharge limits on oil-base or synthetic drilling muds and for produced water.[94] The Panel rejected such extreme versions of precaution and was content to recommend various measures relating to offshore wastes including implementation of an environmental effects monitoring program, further exploration of alternatives to oil-based muds and implementation of environmentally superior waste treatment methodologies if they became available during the life of the project.[95]

In the joint federal-provincial assessment of whether a moratorium for offshore hydrocarbon exploration on Georges Bank should continue, many participants noted the precautionary principle. They argued, "...it was preferable to err on the side of caution and extend the moratorium, in the face of lack of definitive scientific information proving that petroleum activities would cause no harm to the biodiversity, productivity, and fisheries of Georges [Bank]."[96] In the end, noting that "[c]aution is called for",[97] the Review Panel recommended the moratorium on petroleum activities on Georges Bank remain in place.[98]

In the environmental assessment of the Voisey's Bay Mine and Mill Project, a proposal to mine nickel together with some copper and cobalt along the coast in northern Labrador, the terms of reference for the Public Review Panel required the Panel to consider the "extent of application of the precautionary

---

92. *Ibid.* at 91. The amendments provide minimal strengthening to public participation at the screening stage, namely, ensuring public notices of screening commencements are available on the electronic registry and allowing the public to be involved before screening report issuance (but still at the discretion of responsible authorities).
93. *Ibid.* at 102-03. While Bill C-9 would require Cabinet approval before a responsible authority could use the "justified in the circumstances" rationale for approving a project likely to have significant adverse environmental effects, Cabinet deliberations would not be guided by clear criteria.
94. Canadian Environmental Assessment Agency, Nova Scotia Department of the Environment, National Energy Board, Natural Resources Canada, Nova Scotia Department of Natural Resources, Canada-Nova Scotia Offshore Petroleum Board, *The Joint Public Review Panel Report: Sable Gas Projects* (Quebec: Canadian Environmental Assessment Agency, 1997) at 31-32.
95. *Ibid.* at 33.
96. Natural Resources Canada and Nova Scotia Petroleum Directorate, *Georges Bank Review Panel Report* (Halifax: 1999) at 52, online: Canada-Nova Scotia Offshore Petroleum Board <http://www.cnsopb.ns.ca/General/info/georgesbankreport.pdf>.
97. *Ibid.* at 57.
98. *Ibid.* at 59. The federal and provincial governments subsequently agreed to extend the moratorium until 2012.

principle to the Undertaking."[99] While the final report of the Review Panel contained 107 recommendations, many of them aimed at protecting the environment,[100] the Panel's overall recommendation that the Project be allowed to proceed might be described as quite non-precautionary in light of the numerous uncertainties as to the environmental and social impacts of the Project.[101]

The Cape Breton Public Review, seeking public views on proposed hydrocarbon exploration and drilling offshore Cape Breton Island, Nova Scotia and held under the auspices of the Canada-Nova Scotia Offshore Petroleum Board, is another assessment process to address the precautionary principle. The Commissioner, Dr. Teresa MacNeil, submitted her report in late March 2002,[102] and the report demonstrates how the precautionary principle is subject to considerable debate. As stated by the Commissioner:

> Even the meaning of the term "precautionary principle," a concept that formed an integral part of many arguments during the hearings, became a matter for debate. At one end of the spectrum, there were those who interpreted it to mean exploration and drilling activities should not proceed until there was absolute proof they would have no adverse effect on the marine environment. At the other end of the spectrum, were those who suggested there was no need to apply the concept because severity of the potential impacts did not meet certain administrative or legal criteria.[103]

In her conclusion, the Commissioner indicated some discomfort with the interpretive confusion and seemed to be searching for some "middle ground":

> There was much discussion at the hearings about what is known as the "precautionary principle," the notion that it is always "better to be safe than sorry." But there were many interpretations of its meaning, and these variations were more likely to interfere with, rather than to promote, constructive dialogue. Many participants, from all interests represented at the Review, seemed more comfortable using the traditional concept of "reasonable certainty" when attempting to identify the type of certainty they felt was an acceptable basis for decision making purposes. I believe this reasonable certainty approach—by which I mean the kind of certainty that one attempts to achieve by taking all possible precaution to avoid error, including consultations with other interests and knowledgeable parties—is the more reasonable approach, and the one I have used in drawing conclusions and making recommendations.[104]

---

99. The Terms of Reference were included as Schedule 1 to the 1997 Memorandum of Understanding (MOU) on the Environmental Assessment of the Proposed Voisey's Bay Mining Development, involving the Government of Newfoundland and Labrador, the Government of Canada, the Labrador Inuit Association and the Innu Nation. The MOU was reprinted in the *Voisey's Bay Mine and Mill Environmental Assessment Panel Report* as Appendix C, online: Canadian Environmental Assessment Agency <www.acee-ceaa.gc.ca>.
100. *Ibid.* For example, Recommendation 99 urged the proponent to prepare environmental protection plans, contingency plans, in consultation with regulatory agencies, before construction and to subject such plans to review by the Environmental Advisory Board (to be established pursuant to Recommendation 95).
101. See Abouchar, *supra* note 64 at 253-54. For a further review of the assessment process, see Patricia Fry, "A Social Biosphere: Environmental Impact Assessment, the Innu, and Their Environment" (1998) 56:2 U.T. Fac. L. Rev. 177.
102. Canada-Nova Scotia Offshore Petroleum Board, *The Report of Cape Breton Public Review*, (Halifax: 2002), online: Nova Scotia Government <http://www.gov.ns.ca/energy/documents/CBPublicReviewCommissionersReport.pdf>.
103. *Ibid.* at 21.
104. *Ibid.* at 32.

The Commissioner's terms of reference were narrow, calling for a summary of public concerns and findings on probable socio-economic and ecosystem effects of exploration and not a determination of whether proposed exploration activities should proceed. Despite this, the Commissioner made two recommendations. She emphasized the need for further scientific and technical research and for a broadened consultative system at the next stage of the decision-making process.[105]

A further general route towards sorting out the implications of precaution is through strategic planning initiatives, which to date have not involved "courageous plunges" but timid steps. Canada's *Ocean Act*[106] calls for the development of a national oceans management strategy based upon the principles of sustainable development, integrated management and the precautionary approach.[107] However, *Canada's Oceans Strategy*,[108] simply reaffirms the Government of Canada's commitment to promoting the wide application of the precautionary approach to marine resource management with additional general commitments to promote ecosystem-based management, to establish marine protected areas, to improve understanding of the marine environment and to give priority to maintaining ecosystem health and integrity.[109] Potential for future flux in precautionary approach application is indicated: "*Canada's Oceans Strategy* will be governed by the ongoing policy work being undertaken by the Government of Canada."[110]

Through the 1995 amendments to the *Auditor General Act*,[111] twenty-five federal departments and agencies, including the Department of Fisheries and Oceans, have been required to table sustainable development strategies with Parliament.[112] The DFO *Sustainable Development Strategy, 2001–2003*[113] fails to flesh out the implications of precaution. In its principles section, it appears to marginalize precaution by not emphasizing the principle as a stand-alone concept but tucks the precautionary approach under the principle of Science and Knowledge:

> The Department understands the essential knowledge provided by science and the critical role that knowledge and understanding play in making decisions that are sustainable over time. Therefore, as a basis for its decisions, the Department will ... be guided by a *precautionary approach* and risk analysis, recognizing the limitations of our understanding of oceans related sciences....[114]

---

105. *Ibid.* at 35.
106. S.C. 1996, c. 31.
107. *Ibid.*, ss. 29, 30.
108. Fisheries and Oceans Canada, *Canada's Oceans Strategy: Our Oceans, Our Future* (Ottawa: Fisheries and Oceans Canada, 2002).
109. *Ibid.* at 11-12.
110. *Ibid.* at 11.
111. R.S.C. 1985, c. A-17, as am. by S.C. 1995, c. 43.
112. S. 24(1). The first strategies were due in 1997 and the legislation requires departmental sustainable development strategies to be updated at least every three years.
113. Fisheries and Oceans Canada, *Sustainable Development Strategy 2001-2003* (Ottawa: Fisheries and Oceans Canada, 2001), online: Fisheries and Oceans Canada <http://www.ncr.dfo.ca/sds-sdd/susdev_e.pdf>.
114. *Ibid.* at 10 [emphasis added]. The document does pledge to introduce the precautionary approach into fisheries management decision-making and to operationalize its use through a project entitled "Objectives-Based Fisheries Management" and involving ten pilot fisheries by the end of 2003 (*ibid.* at 22).

III. Wadings and Wanderings in Marine Pollution Control

AS THE FOLLOWING DISCUSSION DESCRIBES, Canada has most strongly embraced the precautionary approach in the field of ocean dumping, but is largely wading with rather general and weak commitments in the areas of land-based marine pollution control, the regulation of vessel-source pollution and seabed activities.

A. OCEAN DUMPING

Pursuant to the *CEPA, 1999*,[115] Canada has adopted the "reverse listing" approach to ocean dumping, in line with the *1996 Protocol to the London Convention of 1972*. No person is allowed to dispose of waste or other matter in waters under Canadian jurisdiction unless done in accordance with a Canadian permit, and only substances listed on a "safe list," set out in Schedule 5, may be disposed of at sea.[116] Schedule 5 includes: dredged material; fish wastes; ships, aircraft, platforms or other structures;[117] inert, inorganic geological material; uncontaminated organic matter of natural origin; and bulky substances primarily composed of iron, steel, concrete or other similar matter.[118] As an additional precautionary measure, applicants for ocean disposal are required to undertake a waste prevention audit exploring the feasibility of reducing or preventing wastes through such techniques as process modification, input substitution and closed-loop recycling.[119]

B. LAND-BASED MARINE POLLUTION

While an assessment of Canadian precautionary approaches to land-based marine pollution is complicated by the overlap of provincial and federal jurisdictional controls,[120] a partial picture of Canadian precautionary efforts may be gleaned from looking at the three main federal statutes governing land-based pollution—*CEPA, 1999*, the *Fisheries Act*[121] and the *Pest Control Products Act*[122]—and *Canada's*

115. *Supra* note 62.
116. S. 125.
117. Sch. 5(3). Floating debris or other material that can create marine pollution must be removed to the maximum extent possible and the substances must not pose a serious obstacle to fishing or navigation after disposal.
118. Sch. 5(6). Such substances must not have a significant adverse effect, other than a physical effect, on the sea or seabed and such dumping is to occur in locations where disposal at sea is the only practicable option and without posing a serious obstacle to fishing or navigation.
119. Sch. 6(2)(3). A permit to dispose of waste is to be refused if opportunities exist to reuse, recycle or treat the waste without undue risks to human health or the environment or disproportionate costs (sch. 6(6)).
120. For a discussion of the numerous uncertainties and complexities over federal and provincial jurisdiction to control environmental matters, since Canada's *Constitution Act, 1867* fails to specifically allocate jurisdiction over the environment, see Marie-Ann Bowden, "Jurisdictional Issues" in Elaine L. Hughes, Alastair R. Lucas and William A. Tilleman, eds., *Environmental Law and Policy*, 2d ed. (Toronto: Emond Montgomery, 1998).
121. R.S.C. 1985, c. F-14, as am. by S.C. 1991, c. 1, s. 1 [*Fisheries Act*].
122. R.S.C. 1985, c. P-9, as am. by S.C. 1994, c. 38; S.C. 1995, c. 40. A revised *Pest Control Products Act*, *infra* note 145, received Royal Assent on 12 December 2002 but was not yet proclaimed at the time of writing.

National Programme of Action for the Protection of the Marine Environment for Land-based Activities (NPA).[123]

1) CEPA, 1999

Through *CEPA, 1999*, the Government of Canada has waded into the waters of precaution through four specific references to the precautionary principle. The Preamble recites a *Rio Declaration* version of precaution.[124] The legislation also imposes an administrative duty on the Government of Canada to follow the precautionary principle and emphasizes pollution prevention in implementing the Act.[125] For example, the Minister of the Environment, in deciding whether to authorize the manufacture or import of new chemical substances to Canada, would be obliged to take a precautionary approach.[126] The Act also requires a National Advisory Committee to use the precautionary principle in giving advice and recommendations,[127] for example on proposed regulations.[128] Fourthly, it requires the federal Ministers of Environment and Health, when conducting and interpreting the results of toxicity assessments, to apply "...a weight of evidence approach and the precautionary principle."[129]

CEPA, 1999 might be described as taking a wandering approach to precaution because the Act is not consistent with a strong embrace of the precautionary principle as applied to ocean dumping. The Act, like the previous *CEPA* adopted in 1988, leaves over 23,000 chemicals on the market,[130] and will continue a reactive substance-by-substance toxicity assessment approach before regulatory actions are taken.[131] While the federal Ministers of Health and the Environment are

123. Federal/Provincial/Territorial Advisory Committee on *Canada's National Programme of Action for the Protection of the Marine Environment from Land-based Activities (NPA)* (Ottawa: Minister of Public Works and Government Services Canada, 2000), online: Environment Canada <http://www.ec.gc.ca/marine/npa-pan/docs/intro_meth_e.pdf>. [*NPA*] The *NPA* was finalized in June 2000.

124. *Supra* note 62. The Preamble states:
Whereas the Government of Canada is committed to implementing the precautionary principle that where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation...

125. S. 2 provides:
In the administration of this Act, the Government of Canada shall ... exercise its powers in a manner that protects the environment and human health, applies the precautionary principle that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation, and promotes and reinforces enforceable pollution prevention approaches...

126. S. 84 allows the Minister of Environment to permit or prohibit the manufacture or import of new substances suspected of being toxic or capable of becoming toxic, and the general administrative duty to follow the precautionary principle should guide such decisions.

127. S. 6(1.1).

128. S. 93(3) requires the Minister of Environment to provide an opportunity to the Committee for giving advice on proposed regulations.

129. S. 76.1. For a discussion of some uncertainty about what a weight of evidence approach means in light of a lack of definition under the *Act*, see Abouchar, *supra* note 64 at 239-40.

130. The chemicals allowed to remain on the market are listed on the Domestic Substances List, an inventory of over 23,000 substances manufactured in or imported into Canada on a commercial scale between January 1984 and December 1986. Environment Canada, *CEPA Annual Report: April 1998 to March 1999* (Ottawa: Minister of Public Works and Government Services, 1999) at 13.

131. *Supra* note 62, s. 74. However, s. 73 requires the Ministers of Health and Environment, within seven years of the Act receiving Royal Assent, to categorize the over 23,000 substances on the Domestic Substances List on the basis of available information into those presenting the greatest potential for human exposure in Canada and those which are persistent and bioaccumulative.

required to establish a Virtual Elimination List, setting lowest measurable levels for anthropogenic toxic substances that are persistent and bioaccumulative, the Ministers are granted discretion to forgo virtual elimination in light of "...relevant social, economic or technical matters."[132] While the Act requires the precautionary principle to be followed as an administrative duty, the Act does not provide explicit guidance as to risk management implications.[133] For example, it does not clarify the standard of proof an importer or manufacturer of a chemical new to Canada would have to meet before approval.[134]

CEPA, 1999 is exceedingly weak, partly due to constitutional considerations, in the general powers given to the Federal Government to control land-based marine pollution beyond toxic chemicals. The Act only allows the federal government to establish objectives, guidelines and codes of practice for land-based marine pollution.[135] Also, the Minister of the Environment is only allowed to impose pollution prevention plans for listed toxic substances or international air or water pollutants.[136]

2) Fisheries Act

Legal wanderings toward precaution are especially evident in the main federal lever to control marine pollution, the Federal *Fisheries Act*.[137] Although the Act predates precautionary principle development in international law, the Act does contain provisions somewhat in line with precaution by a general prohibition on deposits of deleterious substances into water frequented by fish and a general prohibition against harmful alterations of fish habitat.[138] However, six sets of regulations[139] under the *Act* allow considerable pollution discharges for specific industries and adopt rather crude, non-precautionary environmental standards, such as pollution limits based on production capacity[140] and acute toxicity testing for effluents.[141]

---

132. S. 65(3).
133. For a further discussion of the unpredictability surrounding inclusion of the precautionary principle in *CEPA*, see Marcia Valiante, "Legal Foundations of Canadian Environmental Policy: Underlining Our Values in a Shifting Landscape" in Van Nijnatten & Boardman, *supra* note 11 at 1.
134. *Supra* note 62. S. 84 grants broad discretion to the Minister of the Environment to permit or prohibit new substances based upon toxicity information provided by the proponent. *New Substances Notification Regulations*, S.O.R./94-260, merely document the information requirements for proposed new substances.
135. Ss. 120-121.
136. S. 56.
137. *Supra* note 74.
138. Ss. 36(3), 35.
139. The regulations are: *Chlor-Akali Mercury Liquid Effluent Regulations*, C.R.C., c. 811; *Meat and Poultry Products Plant Liquid Effluent Regulations*, C.R.C., c. 818; *Metal Mining Effluent Regulations*, S.O.R./2002-222 repealing *Metal Mining Liquid Effluent Regulations*, C.R.C., c. 819; *Petroleum Refinery Liquid Effluent Regulations*, C.R.C., c. 828; *Potato Processing Plant Liquid Effluent Regulations*, C.R.C., c. 829; and *Pulp and Paper Effluent Regulations*, S.O.R./92-269.
140. For example, the *Potato Processing Plant Liquid Effluent Regulations*, *ibid.*, authorize deposits of biochemical oxygen demanding matter (BOD) and total suspended solids (TSS) based upon the amount of raw potatoes processed in potato chip plants authorized to deposit 1.5 kg/tonne of BOD and 2.1 kg/tonne of TSS on a daily basis.
141. The *Pulp and Paper Effluent Regulations*, *supra* note 139, designate acutely lethal effluent as a prescribed "deleterious substance" under the *Fisheries Act*, *supra* note 74, and "acutely lethal" is defined in relation to effluent as that which at 100 percent concentration kills more than 50 percent of the rainbow trout subjected to it during a 96-hour test period.

The enforcement of *Pulp and Paper Effluent Regulations* under the *Fisheries Act* appears to be a particular example of non-precautionary implementation. In May 2002, the Sierra Legal Defence Fund on behalf of various environmental groups,[142] filed a submission with the North American Commission for Environmental Cooperation alleging that Canada is failing to enforce effectively the pollution prevention provisions of the *Fisheries Act* and pulp and paper regulations. The submitters documented over 2,400 alleged violations of pulp and paper mills in central and eastern Canada from 1995 to 2000 with only eight prosecutions under the federal laws (six in Ontario, two in the Atlantic Provinces and none in Quebec).[143]

3) Pest Control Products Act

The existing *Pest Control Products Act*, passed in 1969, while displaying some traits of precaution such as allowing only registered pesticides to be marketed,[144] has been under review for over a decade, and in March 2002, a modernized *Pest Control Products Act* was introduced in Parliament.[145] The Act does have some good points, such as setting out the primary objective of preventing unacceptable risks to people and the environment from the use of pest control products[146] and placing the burden of proof on the person requesting registration of pesticides to demonstrate to the Minister of Health that the risks and value of the pesticides are acceptable.[147]

However, the Act has been seriously criticized for its numerous shortcomings including a failure to embrace strongly the precautionary approach.[148] The Act does not even give a preambular "honourable mention" to precaution and unlike *CEPA, 1999* does not entrench precaution as a general administrative duty. It marginalizes the precautionary principle by only requiring the principle to be taken into account in the course of re-evaluation or special review[149] of a pest con-

142. The groups include Friends of the Earth, Union Saint-Laurent, Grands Lacs, Conservation Council of New Brunswick, Ecology Action Centre and Environment North.

143. Sierra Legal Defence Fund, *Submission to the Commission for Environmental Cooperation Pursuant to Article 14, North American Agreement on Environmental Cooperation* (6 May 2002), online: North American Commission for Environmental Cooperation <http://www.cec.org/files/pdf/sem/01-SUB.pdf>.

144. *Supra* note 122, s. 5.

145. Bill C-53, *An Act to Protect Human Health and Safety and the Environment by Regulating Products Used for the Control of Pests*, 1st Sess., 37th Parl., 2001-2002. The Bill retained the short title of the *Pest Control Products Act*. Bill C-53 died on the *Order Paper* when Parliament was prorogued on 16 September 2002. By motion adopted 7 October 2002, the House of Commons provided for reintroduction of bills not yet receiving Royal Assent into the 2nd session and for reinstatement at the same stage of legislative process. Bill C-53 was reintroduced as Bill C-8, received Royal Assent on 12 December 2002. S.C. 2002, c. 28 [*PCPA*]. For a legislative history, see Library of Parliament, Parliamentary Research Branch, *Bill C-8: An Act to Protect Human Health and Safety and the Environment by Regulating Products Used for the Control of Pests* (Legislative Summary LS-436E) by Monique Hébert (Ottawa: Library of Parliament, 2002).

146. *PCPA*, *supra* note 145, s. 5.

147. *Ibid.*, s. 7(6).

148. See World Wildlife Fund and Canadian Environmental Law Association, *Bill C-53 Briefing Note* (5 April 2002), online: Canadian Environmental Law Association <http://www.cela.ca/toxics/C-53briefingnote.pdf>.

149. *PCPA*, *supra* note 145, s. 17(1) requires the Minister of Health to initiate a special review of a pesticide registration if the Minister has reasonable grounds to believe that the health or the environmental risks of the product are, or its value is, unacceptable.

trol product.[150] Nor does it give legal force to the substitution principle that would require older pesticides to be replaced with newer, less toxic products and non-chemical alternatives.[151] The Act does not define acceptable or unacceptable risk and focuses only on active ingredients not on formulants.[152] The Act fails to give the Pest Management Regulatory Agency a clear statutory mandate.[153] The Act also avoids imposing a legislative ban on the use of pesticides for "cosmetic use" partly because of constitutional limitation concerns.[154]

4) National Programme of Action for Land-Based Activities

The *NPA*, released in June 2000, is helpful in highlighting the main environmental problems in various regions (Pacific, Arctic, Southern Quebec/St. Lawrence, Atlantic) and in establishing national priorities for action. For example, inadequate sewage treatment is listed as a high priority because of substantial environmental and economic effects shared by various regions. Shellfish harvesting closures from bacterial contamination on the Pacific coast are reported at nearly 1000 km^2 (up from 710 km^2 in 1989).[155] The harvesting of shellfish has been permanently or temporarily prohibited in the Quebec Region because of bacterial contamination in nearly half of all shellfish areas.[156] It has also been documented that, "in 1996, 35% of the classified shellfish growing area in Atlantic Canada was closed to harvesting of shellfish because of fecal bacteria...."[157]

However, the *NPA* might be described as weak in addressing precaution. The *NPA* pays "lip service" to the precautionary approach but does not explore what the implications of precaution might be.[158] The *NPA* was not accompanied by

150. S. 20(1) provides that:
The Minister may cancel or amend the registration of a pest control product if ... in the course of a re-evaluation or special review, the Minister has reasonable grounds to believe that the cancellation or amendment is necessary to deal with a situation that endangers human health or safety or the environment, taking into account the precautionary principle set out as subsection (2).

151. *House of Commons Debates*, 168 (15 April 2002) at 10368 (Karen Kraft Sloan).

152. *House of Commons Debates*, 137 (9 April 2002) at 10154 (Hon. Charles Caccia). S. 7(7) of the *PCPA*, *supra* note 145, may be viewed as adopting a weak version of precaution since the Minister of Health is mandated to apply a "scientifically based approach" in determining acceptable risks. The Minister is also required to apply margins of safety for various vulnerable sub-groups including pregnant women, children and seniors. For a review of the "margin of safety" approach in United States' environmental laws, see Frank B. Gosse, "Paradoxical Perils of the Precautionary Principle" (1996) 53 Wash. & Lee L. Rev. 851 at 855.

153. Caccia, *ibid.* The Agency was created within Health Canada in 1995 to assist the Minister of Health in administering the *Pest Control Products Act*. See Library of Parliament, Parliamentary Research Branch, *Bill C-53: An Act to Protect Human Health and Safety and the Environment by Regulating Products Used for the Control of Pests* (Legislative Summary LS-436E) by Monique Hébert (Ottawa: Library of Parliament, 2002) at 2.

154. *House of Commons Debates*, 137 (21 March 2002) at 10103. The Minister of Health, Anne McLellan, at the beginning of the second reading debate on Bill C-53 stated:
One does however have to remember that the federal authority for the pest control products act relies primarily upon the use of the criminal law power.... To include in this legislation a ban of the use of pesticides for what people refer to as cosmetic use could be exposing individuals to criminal prosecution for engaging in an activity which has not been proven to constitute an unacceptable risk. Such a measure I would submit would be beyond the proper scope of the criminal law power.

155. *Supra* note 123 at 37.

156. *Ibid.* at 67.

157. *Ibid.* at 88.

158. *Ibid.* at 4: "Canada's NPA is based upon the principles of sustainable development, integrated management and the precautionary approach."

a specific implementation budget and has depended on the vagaries of funding at national, provincial and municipal levels.[159]

C. VESSEL-SOURCE POLLUTION

Although Canada's legal framework for controlling pollution from ships has precautionary aspects, such as imposing strict liability on ship owners for oil pollution damage[160] and prohibiting discharges of garbage from ships,[161] the framework is not strongly precautionary. The *Canada Shipping Act*[162] does not mention precaution as a guiding principle. Its *Oil Pollution Prevention Regulations*[163] adopt the compromise standards of the *MARPOL Convention*[164] with considerable pollution allowed. For example, oil tankers are authorized to discharge oily mixtures from cargo spaces if they are more than "50 nautical miles from the nearest land" and "the instantaneous rate of discharge of oil in the effluent does not exceed 30 L per nautical mile".[165] The *Pollutant Substances Pollution Prevention Regulations*,[166] rather than imposing a strict precautionary "reverse listing" where only substances listed on a "safe list" would be allowed to be discharged from ships, lists over 300 substances (including many heavy metals and pesticides) that are generally prohibited from discharge.[167]

Perhaps the least precautionary area of vessel-source pollution control is Canada's approach to controlling ballast water releases from ships. It has been estimated that about 75% of species introduced to the Great Lakes since 1970 have arrived via ballast water.[168] Among these species was the zebra mussel (*Dreissena polymorpha*), which was introduced to the Great Lakes in the mid 1980s, and which brought national and international attention to the potential effects of invasive species.[169]

Transport Canada has developed *Guidelines for the Control of Ballast Water*

---

159. *Ibid.* at 1. Chapter 1 of the *NPA* suggests a lack of 'political fervour':
Many programmes are already in place, or are being actively developed, to protect the marine environment. The NPA takes into account the priorities and actions of these existing programmes and recognizes the cost-effectiveness of building upon them.
160. *Marine Liability Act*, S.C. 2001, c. 6, s. 51(1)(a).
161. *Garbage Pollution Prevention Regulations*, C.R.C., c. 1424.
162. R.S.C. 1985, c. S-9. A revamped *Canada Shipping Act, 2001*, S.C. 2001, c. 26, received Royal Assent on November 1, 2001 but the majority of provisions are not yet in force and will depend on further orders of the Governor in Council pursuant to s. 334. The revised Act does not mention the precautionary principle.
163. S.O.R./93-3 [*OPPR*].
164. *International Convention for the Prevention of Pollution from Ships, 1973*, U.K.T.S. 1983 No. 27, 12 I.L.M 1319 (an Additional Protocol was added in 1978, 21 International Environment Reporter 2401) [*MARPOL Convention*].
165. *Supra* note 163, s. 34.
166. C.R.C., c. 1458, as am. by SOR/83-347; SOR/2002-276.
167. S. 4(1).
168. See Edward L. Mills *et al.*, "Exotic Species in the Great Lakes: A History of Biotic Crises and Anthropogenic Introductions" (1993) 19 Journal of Great Lakes Research 1.
169. See Steven A. Ahlstedt, "Invasion and Impacts of the Zebra Mussel in the United States" (1994) 13:1 Journal of Shellfish Research 330.

Discharge from Ships in Waters under Canadian Jurisdiction[170] although there are ongoing discussions regarding the need to transform the *Guidelines* into regulations.[171] The *Guidelines* urge vessels utilizing ballast exchange to conduct exchanges in deep ocean locations of not less than 2000 metres in depth but also provide for alternative exchange zones in Canadian waters where vessels do not voyage into mid-ocean or where there are vessel safety concerns. One such alternative exchange zone is the Laurentian Channel (in depths exceeding 300 metres) on the east coast of Canada, which is designated for ships proceeding to the Great Lakes or St. Lawrence River. At the 2001 meeting of the Canadian Marine Advisory Council, concern was raised about the exchange zone, as there is potential for species to invade coastal waters.[172] While Canada has acknowledged that ballast water is a major vector for invasive species, there is still no specific requirement under the *Fisheries Act* or the *Canada Shipping Act* that dictates the use of precaution in ballast water exchange. Prevention of invasions may eventually require changes in ship technology and there exists potential on board treatments for ballast water.[173]

The 2002 audit of the Commissioner of the Environment and Sustainable Development calls upon Environment Canada to address properly the threat of invasive species and specifically notes Transport Canada's failure to regulate ballast water dumping as well as the past and potential socio-economic ramifications of this neglect.[174] Failure to act on ballast water treatment is implicated in the

---

170. Transport Canada, *Guidelines for the Control of Ballast Water Discharge From Ships in Waters Under Canadian Jurisdiction* (1 September 2000) as am. 8 June 2001 at para. 1.1, online: Transport Canada <http://www.tc.gc.ca/MarineSafety/Tp/Tp13617/Tp13617e.htm> [*Guidelines*]. In September 2000, Transport Canada revised original Guidelines to limit the risk of invasive species in Canadian waters. The Guidelines were initially drawn up in 1989 and have been revised several times to incorporate improvements. The purpose of the Guidelines is stated as follows:
...the protection of waters under Canadian jurisdiction from non-indigenous aquatic organisms and pathogens that can be harmful to existing ecosystems. When a new organism is introduced to an ecosystem, negative and irreversible changes may result including a change in biodiversity. Ballast water has been associated with the unintentional introduction of a number of organisms in Canadian waters and several have been extremely harmful to both the ecosystem and the economic well-being of the nation. These guidelines are intended to minimize the probability of future introductions of harmful aquatic organisms and pathogens from ships' ballast water while protecting the safety of ships.

171. Minutes of Canadian Marine Advisory Council meeting, 5-8 November 2001, cite the role of the Canadian Coast Guard in working with Transport Canada to develop regulations under the *Canada Shipping Act*, 2001.

172. B. Flinn, "Ottawa sends bio-invasion danger east" *The Halifax Daily News* (23 March 2002) 3.

173. While some have suggested ballast water treatments are potentially expensive and require extensive refitting of ships, there exists the possibility of a closed loop ultra-violet treatment of ballast water that could reduce the risk of potential invaders. This technology is currently up for international patent. Personal Communication with Paul Brodie, Independent Research Scientist, Halifax (23 May 2002).

174. See Auditor General of Canada, *Report of the Commissioner of the Environment and Sustainable Development to the House of Commons, Chapter 4: Invasive Species* (Ottawa: Minister of Public Works and Government Services Canada, 2002) at 13-21, online: Office of the Auditor General <http://www.oag-bvg.gc.ca/domino/reports.nsf/html/c20021004ce.html/$file/c20021004ce.pdf> [*Report of the Commissioner*].

recent introduction of the fatal oyster parasite, MSX, in the Bras d'Or Lakes.[175] This parasite effectively wiped out oyster stocks in Chesapeake Bay in the 1950s. The Bras d'Or Lakes have been cited by Transport Canada[176] as an area particularly vulnerable to marine invasions, yet no action has yet been taken on ballast exchange or treatment. With regard to the precautionary principle, the *Report of the Commissioner* concludes:

> The precautionary principle, pollution prevention, and the concept of "polluter pays" have been part of Canada's environmental policies for more than a decade. The federal government is not applying them to manage invasive species that threaten our environment.[177]

D. SEABED ACTIVITIES

The legal framework governing offshore petroleum exploration and development in Canada, the main type of seabed activity,[178] does not strongly embrace a precautionary approach. None of the multiple statutes governing environmental aspects of offshore petroleum activities mentions the precautionary principle.[179] No specific regulatory requirements have been forged for chemicals used in offshore drilling and production activities; flexible guidelines have been issued.[180] Environmental impact assessment of proposed offshore hydrocarbon exploration activities off Newfoundland and Nova Scotia has been limited because the *CEAA*

---

175. See "Parasite threatens Atlantic oyster industry" *CBC News* (24 October 2002), online: CBC <http://www.cbc.ca/stories/2002/10/24/oysters021024>; "Oyster-killing Bug Threatens Maritime Industry: Parasite Has Spread to P.E.I." *The [Halifax] Chronicle-Herald* (19 November 2002) A11.
176. See C.E. Carver and A.L. Mallet "A Preliminary Assessment of the Risks of Ballast Water Mediated Introduction of Non-indigenous Phytoplankton and Zooplankton Species into Nova Scotian Waters" submitted to Transport Canada, Marine Safety Division (19 April 2001), online: Fundy Forum <http://www.fundyforum.com/pdfs/Ballast.PDF>.
177. *Supra* note 174 at para. 4.104.
178. This paper does not specifically address the control of offshore mineral exploration / exploitation where general legislative controls may apply, such as the prohibition of deleterious deposits under the *Fisheries Act*.
179. A complicated regulatory scheme, addressing the oil and gas sector, involves offshore petroleum board leadership in regulating activities offshore Newfoundland and Nova Scotia and responsibility of the National Energy Board for regulating operations in the rest of Canada's offshore. Key pieces of legislation include: *Canada-Newfoundland Atlantic Accord Implementation Act*, S.C. 1987, c. 3; *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*, R.S.N.L. 1990, c. C-2 (formerly *Canada-Newfoundland Atlantic Accord Implementation Newfoundland Act*); *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*, S.C. 1988, c. 28; *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act*, S.N.S. 1987, c. 3; *Canada Oil and Gas Operations Act*, R.S.C. 1985, c. O-7 (formerly *Oil and Gas Production and Conservation Act*). For useful overviews of the legislative and regulatory complexities, see Van Penick, "Legal Framework in the Canadian Offshore" (2001) 24 Dal. L.J. 1; Angus Taylor & Jim Dickey, "Regulatory Regime: Canada-Newfoundland/Nova Scotia Offshore Petroleum Board Issues" (2001) 24 Dal. L.J. 51.
180. National Energy Board, Canada-Newfoundland Offshore Petroleum Board & Canada-Nova Scotia Offshore Petroleum Board, *Guidelines Respecting the Selection of Chemicals Intended To Be Used in Conjunction with Offshore Drilling & Production Activities on Frontier Lands* (January 1999), online: Canada-Newfoundland Offshore Petroleum Board <http://www.cnopb.nfnet.com/publicat/guidelin/ocsg/ocsg.pdf>.
181. *Supra* note 75. Regulatory amendments are envisaged to require oil and gas exploration projects, such as seismic activities and exploratory wells, under the jurisdiction of the offshore petroleum boards, to be subject to the *CEAA*. See Canadian Environmental Assessment Agency, News Release, "Amended Federal Regulations to Include Canada-Nova Scotia Offshore Petroleum Board" (31 January 2001), online: Canadian Environmental Assessment Agency <http://www.ceaa.gc.ca/0011/0004/nr010131_e.htm>.

is triggered only at the development stage where actual production is proposed.[181]

The precautionary principle is beginning to be acknowledged in the oil and gas regulatory field. For example, the *Memorandum of Understanding between the Canada-Nova Scotia Offshore Petroleum Board and the Department of Fisheries and Oceans*[182] for coordinating management roles over offshore petroleum activities recognizes the precautionary approach as one of the principles of cooperation.[183] A similar memorandum of understanding (MOU) between the Canada-Nova Scotia Offshore Petroleum Board and Environment Canada also refers to the precautionary principle.[184]

The 1996 *Offshore Waste Treatment Guidelines*[185] underwent a process of revision through a multi-stakeholder working group chaired by the Canada-Newfoundland Offshore Petroleum Board, and the review treated the search for stricter waste discharge standards as a precautionary effort. As stated in a backgrounder to the revision work:

> In consideration of the Precautionary Principle, the current draft reflects the philosophy that, even in the absence of demonstrably serious environmental effects, best practicable treatment technology should be utilized if so doing will result in substantially less contaminants being discharged to the environment.[186]

However, the revised *Offshore Waste Treatment Guidelines* finalized in 2002[187] do not expressly mention the precautionary approach, and the Guidelines will likely continue allowing considerable marine discharges from offshore petroleum activities. The Guidelines state that the waste standards will "normally" be applied in granting oil and gas authorizations and approvals.[188] While whole oil-based drilling muds, whole synthetic-based muds and whole enhanced mineral oil-based muds are not to be discharged to the sea, water-based muds are allowed to be discharged.[189] For produced water, operators should, as a part of a development application, examine technical and economic feasibility of alternatives to

---

182. Online: Canada-Nova Scotia Offshore Petroleum Board <http://www.cnsopb.ns.ca/Environment/CNSOPBDFOMOUJulFinal.html>.
183. *Ibid.*, s. 4.3, recognizes the precautionary approach:
Both Parties promote the wide application of the precautionary approach to the conservation, management and exploitation of marine resources in order to protect these resources and preserve the marine environment. The uncertain and incomplete nature of science relating to the environment invokes the precautionary approach where it is necessary to exercise caution in adopting safe minimal standards for all development. When there are threats of serious or irreversible damage, lack of full scientific certainty will not be used as a reason for postponing measures to prevent environmental degradation.
184. Online: Canada-Nova Scotia Offshore Petroleum Board <http://www.cnsopb.ns.ca/Environment/2002mou.pdf> at 3.
185. National Energy Board, Canada-Newfoundland Offshore Petroleum Board & Canada-Nova Scotia Offshore Petroleum Board, *Offshore Waste Treatment Guidelines* (September 1996), online: Canada-Newfoundland Offshore Petroleum Board <http://www.cnopb.nfnet.com/publicat/guidelin/owtgl/eng/owtgen.htm>.
186. Canada-Nova Scotia Offshore Petroleum Board, News Release, "Draft Revised Offshore Waste Treatment Guidelines: Backgrounder" (February 2002), online: Canada-Nova Scotia Offshore Petroleum Board <http://www.cnsopb.ns.ca/whatsnew/bacjan02.html>.
187. National Energy Board, Canada-Newfoundland Offshore Petroleum Board & Canada-Nova Scotia Offshore Petroleum Board, Guidelines, "Offshore Waste Treatment Guidelines" (August 2002), online: Canada-Nova Scotia Offshore Petroleum Board <http://www.cnsopb.ns.ca/whatsnew/owtg_redraft.pdf>.
188. *Ibid.* at 2.
189. *Ibid.* at 5–6.

conventional marine discharge of produced water containing oil, such as subsurface reinjection or subsea separation.[190] Production installations commencing operation following publication of the Guidelines should ensure that the 30-day weighted average of oil in discharged produced water does not exceed 30mg/L, and that the 24-hour arithmetic average of oil in produced water does not exceed 60 mg/L.[191] Drill solids, particles generated by drilling into geological formations and carried to the surface with drilling muds, may not be discharged into the sea when associated with oil-based drilling muds. However, where drill solids associated with synthetic-based drilling muds or enhanced mineral oil-based muds cannot be reinjected because of technical or economic feasibility, the solids can be discharged if treated with best available treatment technology.[192]

In British Columbia, where the Liberal Party won the election in May 2001 with an intent of re-examining an offshore oil and gas moratorium in place since the early 1970s,[193] a Scientific Review Panel was appointed by the British Columbia Minister of Energy and Mines in October 2001 to review scientific, technological, and regulatory issues associated with a possible lifting of the moratorium. Reporting in January 2002, the Panel recognized the precautionary approach, but did not extensively discuss the law and policy implications. The Panel endorsed the 1998 Wingspread Statement on the Precautionary Principle which advocated that the proponent of an activity, rather than the public, should bear the burden of proof.[194] However, the Panel also emphasized the observation in the 2001 Lowell Statement on Science and the Precautionary Principle that "[t]he goal of precaution is to prevent harm, not to prevent progress."[195] The Panel noted the divisions among specialists regarding what precautionary responses should be where there is a credible risk of substantial environmental damage.[196] The Panel recommended that, before actual exploration activities take place, a quantitative risk analysis should be undertaken along with a thorough cost-benefit analysis.[197]

---

190. *Ibid.* at 4.

191. *Ibid.* For production installations in operation before publication of the guidelines, the limits are 40 mg/L (30-day weighted average) and 60 mg/L (24-hour arithmetic average).

192. *Ibid.* at 7. A concentration of 6.9 g/100g or less oil on west solids is suggested as the best available technology standard at the time of Guidelines publication.

193. See *e.g.* Douglas M. Johnston, *B.C. Offshore Development Issues: The 2002 Dunsmuir Symposium Report* (Victoria: Maritime Awards Society of Canada, 2002) at 1.

194. British Columbia, Ministry of Energy and Mines, *British Columbia Offshore Hydrocarbon Development: Report of the Scientific Review Panel*, vol. 1 (Victoria: Ministry of Energy and Mines, 2002) at ii [*M.E.M. Report*], online: British Columbia Ministry of Energy and Mines <http://www.em.gov.bc.ca/oil&gas/offshore/OffshoreOilGasReport/Default.htm>.

195. *Ibid.* See also British Columbia, Ministry of Energy and Mines, *British Columbia Offshore Hydrocarbon Development: Appendices to the Report of the Scientific Review Panel*, vol. 2 (Victoria: Ministry of Energy and Mines, 2002) at 143-45 (Appendix 20), online: British Columbia Ministry of Energy and Mines <http://www.em.gov.bc.ca/oil&gas/offshore/OffshoreOilGasReport/2-Appendix20.pdf>.

196. *M.E.M. Report, supra* note 194 at 46.

197. *Ibid.*, Recommendation 7.

IV. Living Marine Resource Management and Precaution

A. FISHERIES

Various Canadian fishery policy discussion documents and policy statements have acknowledged the need for adopting the precautionary approach in fisheries management, but at quite a general level without detailed suggestions for legal reforms. For example, the Atlantic Fisheries Policy Review process, involving multistakeholder consultations on future directions for fisheries management on the east coast of Canada, has suggested a number of general improvements in fisheries management under the banner of the precautionary approach:

· clearly identifying management objectives and reference points to guide management decisions and determine unacceptable outcomes before they happen;

· agreeing on a set of predetermined management responses that will be taken as soon as the risk of undesirable outcome exceeds the tolerable level;

· taking into account the uncertainty in data, stock assessments and the implementation of fishery controls;

· applying prudent foresight in establishing fishing plans aimed at harvesting the resource at sustainable levels;

· increasing the use of selective fishing gear and other responsible fishing practices; and

· using effective monitoring and control measures to ensure compliance with conservation and management objectives.[198]

The Department of Fisheries and Oceans' *Wild Salmon Policy Discussion Paper* emphasizes the need for a conservation-based approach to management of Pacific fisheries and the application of the precautionary approach. To operationalize precaution, the document suggests the establishment of limit and target reference points for salmon populations.[199]

The first listed principle of the Department of Fisheries and Oceans' *Policy for Selective Fishing in Canada's Pacific Fisheries* adopts the precautionary approach. The policy establishes conservation of Pacific fisheries as the primary objective, and pledges that productivity of the resource will not be compromised because of short-term factors or considerations.[200]

A Department of Fisheries and Oceans policy for determining when new fisheries can be initiated also recognizes the precautionary approach.[201] The poli-

198. Canada, Atlantic Fisheries Policy Review, *The Management of Fisheries on Canada's Atlantic Coast: A Discussion Document on Policy Directions and Principles* (Ottawa: Atlantic Fisheries Policy Review, 2000) at 17-18, online: Fisheries and Oceans Canada <www.dfo-mpo.gc.ca/afpr-rppa/discdoc_e.pdf>.

199. Fisheries and Oceans Canada, *Wild Salmon Policy: Discussion Paper* (Vancouver: Fisheries and Oceans Canada, 2000) at 4, online: Fisheries and Oceans Canada <http://www-comm.pac.dfo-mpo.gc.ca/wsp-sep-consult/wsp/wsp-paper.pdf>.

200. Fisheries and Oceans Canada, *A Policy for Selective Fishing in Canada's Pacific Fisheries* (Ottawa: Fisheries and Oceans Canada, 2001) at 8, online: Fisheries and Oceans Canada <http://www-comm.pac.dfo-mpo.gc.ca/publications/selectivep_e.pdf>.

201. Fisheries and Oceans Canada, *New Emerging Fisheries Policy* (Ottawa: Fisheries and Oceans Canada, 2001), online: Fisheries and Oceans Canada <http://www.dfo-mpo.gc.ca/communic/fish_man/nefp_e.htm>.

cy suggests placing the burden on fisheries proponents to provide a reasonable scientific basis for fisheries management through stock assessment information.

Practical efforts to invoke precaution in fisheries management, however, have been limited and at times questionable.[202] While fisheries closures have been used effectively, the establishment of Marine Protected Areas has lagged. Over-reliance on quota management has occurred and at times precautionary scientific advice ignored. In some cases the precautionary approach has been invoked without adequate knowledge of ecosystem effects. A much broader approach to precaution seems necessary.

1) Fisheries Closures and Lag in Marine Protected Areas

Specific areas, determined to be essential for spawning or juvenile habitat, can be closed seasonally or permanently under the *Fisheries Act*.[203] Prior to the adoption of the United Nations Food and Agriculture Organization's *Code of Conduct for Responsible Fisheries*[204] or the ratification of the *1995 UN Fish Stocks Agreement*,[205] the Federal Department of Fisheries and Oceans had already closed certain areas to fishing. An example is the "Haddock Box" area on the Scotian Shelf, which has been closed since 1987 to protect juvenile haddock, thereby allowing the stock to rebuild.[206] More recently, fisheries closures of areas encompassing habitat structure, including the closure of 424 square kilometres in the Northeast Channel between Georges Bank and Browns Bank for deep-sea coral conservation[207] and areas of the Hecate Strait in the Pacific to protect ancient sponge reefs,[208] signify that the Federal Government is beginning to recognize the importance of habitat for fisheries conservation.

The *Oceans Act* authorizes the establishment of Marine Protected Areas as

---

202. For example, the Department of Fisheries and Oceans is just initiating an Objective-Based Fisheries Management (OBFM) pilot through the Scotia-Fundy Groundfish Management Plan for 2002-2007. One of the three general objectives of the plan is to ensure fishing for groundfish does not cause reductions in resource productivity or modifications to ecosystem structures or functions that are difficult or impossible to reverse by adopting a precautionary approach to management. See Fisheries and Oceans Canada, *Groundfish Management Plan: Scotia-Fundy Fisheries Maritimes Region, April 1, 2002 - March 31, 2007* (Ottawa: Fisheries and Oceans Canada, 2002) at 3, 13. A response by the Department of Fisheries and Oceans to the recent federal discussion paper on the precautionary approach admits that there is little tangible evidence of the implementation of precaution in fisheries management. The authors advise setting specific biological limits to overfishing for all stocks, rather than wait for an integrated approach to precautionary management. See Canadian Science Advisory Secretariat, *Limits to Overfishing: Reference Points in the Context of the Canadian Perspective on the Precautionary Approach* by Peter A. Shelton & Jake C. Rice (Ottawa: Fisheries and Oceans Canada, 2002) at 4, online: Fisheries and Oceans Canada <www.dfo-mpo.gc.ca/csas/csas/DocREC/2002/RES2002_084e.pdf>.

203. *Supra* note 74.

204. *Supra* note 2.

205. *Ibid.*

206. See Kenneth T. Frank, Nancy L. Shackell & James E. Simon, "An Evaluation of the Emerald/Western Bank Juvenile Haddock Closed Area" (2000) 57 ICES J. Marine Sci. 1023.

207. See Fisheries and Oceans Canada, News Release NR-MAR-02-10E, "Minister Thibault Announces 2002 Georges Bank Groundfish Management Plan" (21 June 2002), online: Fisheries and Oceans Canada <http://www.mar.dfo-mpo.gc.ca/communications/maritimes/news02e/NR-MAR-02-10E.html>.

208. See Fisheries and Oceans Canada, News Release NR-PR-02-044E, "Groundfish Trawlers Help to Protect Unique Sponge Reefs in B.C." (18 July 2002), online: Fisheries and Oceans Canada <www-comm.pac.dfo-mpo.gc.ca/English/release/p-releas/2002/nr044e.htm>.

a measure to protect biodiversity and sustain fish populations.[209] However, Canadian efforts to designate and protect such areas have been extremely slow. Marine Protected Area establishment may not be popular with fishers, and the criteria for protection and selection of areas, as well as specific objectives for protection, have yet to be agreed upon.[210] There are thirteen candidate Marine Protected Areas, referred to as Areas of Interest, with four in the Pacific region, six in the Atlantic region, two in Quebec and one in the Beaufort Sea.[211] Formal establishment of Marine Protected Areas through regulation has yet to occur, pending input from local communities, First Nations, stakeholders and the public.[212] Additional Marine Protected Areas may be precluded in some areas due to leases for oil and gas exploration.[213]

The new *Canada National Marine Conservation Areas Act* legislation, which received Royal Assent on 13 June 2002,[214] also recognizes the precautionary principle but designation of areas is at a political commitment stage. This statute, besides mentioning the precautionary principle in the preamble,[215] requires the Minister of Canadian Heritage to develop management plans within five years after marine conservation areas are established. Primary considerations in development and modification of plans are to be the "principles of ecosystem management and the precautionary principle."[216] In the Speech from the Throne on 30 September 2002, the Government of Canada announced a commitment to create five new National Marine Conservation Areas over the next five years.[217]

---

209. S.C. 1996, c. 31, s. 35(2) provides: "For the purposes of integrated management plans referred to in sections 31 and 32, the Minister will lead and coordinate the development and implementation of national system of marine protected areas on behalf of the Government of Canada."
210. See Glen S. Jamieson & Colin O. Levings, "Marine Protected Areas in Canada–Implications for Both Conservation and Fisheries Management" (2001) 58 Can. J. Fish. Aquat. Sci. 138. Although there are currently some 198 protected areas with a marine component under federal and provincial jurisdiction in Canada, the majority of these are provincial parks, wildlife reserves or bird sanctuaries.
211. Personal communication of Derek Fenton, Oceans and Coastal Management Division, Fisheries and Oceans Canada, Maritimes Region (12 November 2002). Ten Areas of Interest are listed on the Fisheries and Oceans Canada website. See Fisheries and Oceans Canada, "Marine Protected Area–Areas of Interest", online: Fisheries and Oceans Canada <http://www.dfo-mpo.gc.ca/oceanscanada/newenglish/htmdocs/mpas/mpa2.htm>.
212. In September 2002, the Oceans and Coastal Management Division of the Department of Fisheries and Oceans released for public consultation a regulatory discussion document for the Gully Marine Protected Area, the largest submarine canyon in the western North Atlantic. The document suggests dividing the Gully into three zones with general prohibitions on damaging or disturbing activities followed by exceptions, such as limited commercial fishing for halibut, swordfish and tuna in zones two and three. See *The Gully Marine Protected Area* (27 September 2002) [unpublished, copy provided to the authors by Bob Rutherford, Oceans and Coastal Management Division, Department of Fisheries and Oceans, Maritimes Region].
213. Offshore oil and gas leases on the Scotian Shelf cover the majority of the slope area, with the exception of the Sable Island Gully candidate Marine Protected Area. See map online: Canada-Nova Scotia Offshore Petroleum Board < http://www.cnsopb.ns.ca/Maps/printable.html>.
214. S.C. 2002, c. 18.
215. *Ibid.*, the Preamble states:
Whereas the Government of Canada is committed to adopting the precautionary principle in the conservation and management of the marine environment so that, where there are threats of environmental damage, lack of scientific certainty is not used as a reason for postponing preventive measures.
216. *Ibid.*, ss. 9(1), 9(3).
217. See Government of Canada, "The Canada We Want: Speech from the Throne to open the Second Session of the Thirty-Seventh Parliament of Canada," (30 September 2002), online: Government of Canada <http://www.pco-bcp.gc.ca/sft-ddt/hnav/hnav08_e.htm>.

2) Over-reliance on Quota Management and Ignoring of Precautionary Scientific Advice

Canada's experience with collapses in fish stocks, such as the crisis in the east coast ground fishery since 1992, help demonstrate the limitations with the primary method of fisheries management—the setting of total allowable catches (TAC) for most fisheries based on reference points. Simply managing according to reference points[218] does not lead to sustainable fisheries, due to the uncertainty in estimating reference points, and the general lack of specific management objectives.[219] Estimates of fishing mortality are biased, and do not include discards[220] or indirect mortality.[221] Fisheries regulations encourage large amounts of discarding, and political decisions often overrule precautionary scientific advice in fisheries management.[222]

An example of the non-precautionary approach spawned by over-reliance on setting total allowable catches and not following scientific precautionary advice may be seen in the events surrounding the collapse of commercial fisheries for Atlantic cod (*Gadus morhua*), especially off the coast of Newfoundland. Massive social disruption has occurred, including loss of work for some 40,000 fisheries workers, and the Canadian government has spent approximately four billion dollars on special fisheries relief programs.[223] Fundamental to this collapse was the fact that fishing mortality was consistently much higher than the recommended level, and that no effective measures were taken to ensure that young fish were not discarded or that spawning biomass was maintained at adequate levels.[224]

Since the moratorium on directed fishing, which began in 1992, numerous measures have been taken with little regard for precaution. Catches have continued through bycatch from other groundfish species, sentinel fisheries which began in 1995 and recreational or food fisheries.[225] Exploitation rates calculated from the results of tagging experiments conducted through the sentinel fishery have estimated fishing mortality to be between 10–30% of the total fish biomass,[226]

---

218. The *1995 UN Fish Stocks Agreement*, *supra* note 2 at Annex 11 specifies that F_{MSY}, the fishing mortality rate that can produce maximum sustainable yield (MSY) is a limit point that cannot be exceeded. B_{MSY}, or the biomass that can sustain MSY given F_{MSY}, is suggested as a target for re-building over-fished stocks.

219. See Laura J. Richards & Jean-Jacques Maguire, "Recent International Agreements and the Precautionary Approach: New Directions for Fisheries Management Science" (1998) 55 Can. J. Fish. Aquat. Sci. 1545.

220. See Breeze, *supra* note 17.

221. See Ransom A. Myers, Susanna D. Fuller & Daniel G. Kehler, "A Fisheries Management Strategy Robust to Ignorance: Rotational Harvest in the Presence of Indirect Fishing Mortality" (2000) 57 Can. J. Fish. Aquat. Sci. 2357.

222. See Jeffrey A. Hutchings, Carl Walters & Richard L. Haedrich, "Is Scientific Inquiry Incompatible With Government Information Control?" (1997) 54 Can. J. Fish. Aquat. Sci. 1198. Despite scientific advice which suggested the collapse of the cod stocks, political motivations prevented precautionary management decisions.

223. See Michael Harris, *Lament for an Ocean: The Collapse of the Atlantic Cod Fishery: A True Crime Story* (Toronto: McClelland & Stewart, 1998) at 5-6, 314.

224. See Ransom A. Myers, Jeffrey A. Hutchings & Nicholas J. Barrowman, "Why Do Fish Stocks Collapse? The Example of Cod in Atlantic Canada" (1997) 7(1) Ecological Applications 91.

225. See Fisheries and Oceans Canada, *Northern (2J+3KL) Cod Stock Status Update*, Stock Status Report A2-01 (Ottawa: Fisheries and Oceans Canada, 2002) at 2 [*Northern Cod Stock*], online: Fisheries and Oceans Canada <http://www.dfo-mpo.gc.ca/CSAS/CSAS/English/Publications/Stock_Report_e.htm>.

226. *Ibid.* at 1.

despite the ban on directed fishing. In 2000, the Fisheries Resource Conservation Council (FRCC) recommended a TAC not to exceed 7,000t[227] to be taken in the recreational, sentinel and bycatch fisheries. One year later, the FRCC recommended ceasing the recreational fishery and further limiting the small boat fishery with a total removal cap of 5,600t.[228] Fisheries scientists have stated that a catch of no more than 200t is necessary for research purposes and have recommended a reduction of removals, based on the precautionary approach.[229] In 2002, the FRCC recommended a TAC of 5,600t, including all fisheries and bycatch, even though there was known to be an estimated overshoot of the 2001 quota by 1,900t.[230]

Given that there is no estimate of discards or unreported catches, as well as the high levels of fishing mortality estimated by fisheries scientists, the precaution suggested by scientists is not being carried through in the catch recommendations. Continued fishing at these levels is inconsistent with both the mandate of the FRCC[231] and the United Nations Food and Agriculture Organization's *Code of Conduct for Responsible Fisheries*.[232]

3) Invoking Precaution with Inadequate Knowledge

There is also a danger of invoking the precautionary approach without adequate knowledge about ecosystem effects, as shown by two Canadian examples. In 1999, the FRCC, acting in the interests of conserving groundfish stocks in the Northwest Atlantic, recommended the following:

> In applying the precautionary approach to groundfish management, action must be taken immediately in order to improve opportunities for the conservation and recovery of cod.... [W]e strongly suggest that the seal herds be reduced by up to 50% of their current population levels.[233]

Here, precaution was suggested—a large scale culling of seals—with no real knowledge of the effect of the seal population on the cod fishery. Such a sugges-

---

227. Canada, Fisheries Resource Conservation Council, *2000 / 2001 Conservation Requirements for Georges Bank Groundfish Stocks and 2J3KL Cod: Report to the Minister of Fisheries and Oceans*, FRCC.00.R.4 (Ottawa: Minister of Public Works and Government Services Canada, 2000) at 24, online: Fisheries Resource Conservation Council <http://www.ncr.dfo.ca/frcc/eindex.htm>.
228. Canada, Fisheries Resource Conservation Council, *2001 / 2002 Conservation Requirements for 2J3KL Cod: Report to the Minister of Fisheries and Oceans*, FRCC.2001.R.5 (Ottawa: Minister of Public Works and Government Services Canada, 2001) at 12, online: Fisheries Resource Conservation Council <http://www.ncr.dfo.ca/frcc/eindex.htm>.
229. See *Northern Cod Stock*, *supra* note 225 at 2.
230. Letter from Fred Woodman, Chairman, Fisheries Resource Conservation Council to Minister of Fisheries and Oceans (22 May 2002), online: Fisheries Resource Conservation Council <http://www.dfo-mpo.gc.ca/frcc/newsrel/2002/letncod.htm>.
231. Canada, Fisheries Resource Conservation Council, *Terms of Reference* s. 3.1.1, online: Fisheries Resource Conservation Council <http://www.dfo-mpo.gc.ca/frcc/Baseinfo/terms_of_reference.htm>. The Council must make recommendations that lead to "rebuilding stocks to their 'optimum' levels and thereafter maintaining them at or near these levels, subject to natural fluctuations, and with 'sufficient' spawning biomass to allow a continuing strong production of young fish."
232. *Supra* note 2.
233. Canada, Fisheries Resource Conservation Council, *1999 Conservation Requirements for the Gulf of St. Lawrence Groundfish Stocks and Cod Stocks in Divisions 2GH and 3Ps: Report to the Minister of Fisheries and Oceans*, FRCC.99.R.1 (Ottawa: Minister of Public Works and Government Services Canada, 1999) at 11, online: Fisheries Resource Conservation Council <http://www.dfo-mpo.gc.ca/frcc/newsrel/2002/letncod.htm>.

tion does not take into account the complexities of marine food webs, nor does it adhere to an ecosystem approach. However, fishers and managers alike have often blamed the burgeoning seal population with the continued low biomass of cod. More recent findings suggest that seal populations may in fact have a positive effect on cod stocks in the Gulf of St. Lawrence.[234]

In response to the FRCC recommendation, the Federal Minister of Fisheries and Oceans appointed a panel to investigate both scientific and management objectives for the seal populations. The results of this panel showed that there were no reference points for seal population management, nor were there specific management objectives.[235]

In a recent report to the Northwest Atlantic Fisheries Organization (NAFO),[236] it was suggested that, in the interests of protecting juvenile groundfish species on the Southern Grand Bank, fishing for Greenland halibut (turbot) be restricted to below 700m. This would be a precautionary measure taken to ensure that juveniles are not subject to dangerously high fishing mortality. The difficulty with this management suggestion (which was in fact rejected by NAFO) is that there was no consideration given to the effects of increasing fishing pressure in deeper waters. Making a decision based on what is known about the by-catch of juveniles, without considering the risk involved in limiting a fishery to depths where little is known, is an example of improperly invoking precaution.

4) Need for a Broader Precautionary Approach in Fisheries

With a focus on the scientific basis for precaution through reference points and control limits, Canada has lagged in strongly implementing precaution in support of sustainable fisheries,[237] and a broader approach to precaution needs to be considered. A broader approach would emphasize the collection of ecological data, multidisciplinary inputs into management decisions, increased communication between fishers and managers and a commitment to the preservation of fishing communities.[238]

---

234. See D.P. Swain & A.F. Sinclair, "Pelagic Fishes and the Cod Recruitment Dilemma in the Northwest Atlantic" (2000) 57 Can. J. Fish Aquat. Sci. 1321.

235. See Fisheries and Oceans Canada, *Report of the Eminent Panel on Seal Management* (Ottawa: Communications Branch, Fisheries and Oceans Canada, 2001) (Chair: Dr. Ian McLaren), online: Fisheries and Oceans Canada <http://www.dfo-mpo.gc.ca/seal-phoque/reports/expert/SealManagement2001.pdf>.

236. Northwest Atlantic Fisheries Organization Scientific Council Meeting, *Distribution of Greenland Halibut and By-Catch Species that Overlap the 200-Mile Limit Spatially and in Relation to Depth - Effect of Depth Restrictions in the Fishery* by D.W. Kulka, NAFO SCR Doc. 01/40 (Dartmouth: 31 May–14 June 2001).

237. There are a few exceptions, for example, where an inherently precautionary harvesting technique has allowed for a sustainable fishery as in the snow crab (*Chionectes opilio*) fishery. Only males are harvested as males are larger and females can escape from the traps. Coupled with limited entry access to the fishery, the snow crab populations may be sustainably harvested, as in the Gulf of St. Lawrence.

238. See Ray Hilborn *et al.*, "The Precautionary Approach and Risk Management: Can They Increase the Probability of Successes in Fishery Management?" (2001) 58 Can. J. Fish. Aquat. Sci. 99. The authors make the case that precaution must be used not only towards sustainable fish stocks, but towards sustaining fishing communities as well. They advocate a process of portfolio management, where a fisher has several licenses and can thereby have an effective multi-species fishery that will allow for declines in one or more species without causing a major economic decline in the community. See also Anthony T. Charles, "The Precautionary Approach and 'Burden of Proof' Challenges in Fishery Management" (2002) 70 Bulletin of Marine Science 683 at 692-93.

B. AQUACULTURE

The precautionary principle has not strongly infiltrated the field of aquaculture management in Canada. The various memoranda of understandings, whereby the Federal Government and provinces have agreed to jurisdictional arrangements for controlling marine aquaculture developments, do not mention the key principles of sustainable development, including the precautionary principle.[239] No provincial aquaculture legislation has expressly incorporated reference to the principle.[240] The Office of Sustainable Aquaculture of the Department of Fisheries and Oceans has developed an *Aquaculture Policy Framework*, but the policy document is quite general as to how the precautionary approach might apply to aquaculture activities:

> DFO's use of the precautionary approach in the context of aquaculture development will be informed by the *Oceans Act* and federal direction regarding risk management, including the application of the precautionary approach.[241]

The province of British Columbia has taken policy decisions and initiatives somewhat in accord with the precautionary approach.[242] In 1995, the province imposed a moratorium on new salmon farm tenures, capping the number at 121 farms because of concerns over their impact upon the marine environment and the appropriateness of farm sitings.[243] In 1997 the province completed a comprehensive environmental assessment of salmon aquaculture, and the Environmental Assessment Office made 49 recommendations for improving management

---

239. The MOUs with British Columbia, New Brunswick, Nova Scotia and Newfoundland delegate aquaculture licensing to the provincial level, while the MOU with Prince Edward Island leaves licensing responsibility with the federal government. For a review, see David L. VanderZwaag, Gloria Chao & Mark Covan, "Canadian Aquaculture and the Principles of Sustainable Development: Gauging the Law and Policy Tides and Charting a Course" (2002) 28:1 Queen's L.J. 279.

240. See *e.g.* the purpose section of Nova Scotia's *Fisheries and Coastal Resources Act*, S.N.S. 1996, c. 25, s. 2, which emphasizes the need to increase aquaculture production and to optimize aquaculture processing and only mentions community involvement as a principle of sustainable development.

241. Fisheries and Oceans Canada, *DFO's Aquaculture Policy Framework* (Ottawa: Communications Branch, Fisheries and Oceans Canada, 2002) at 24. The Standing Senate Committee on Fisheries has recommended that the Department of Fisheries and Oceans define the precautionary approach as it pertains to aquaculture and issue a written public statement on how the precautionary approach is being applied to the aquaculture sector. See Canada, Standing Senate Committee on Fisheries, *Aquaculture in Canada's Atlantic and Pacific Regions: Interim Report of the Standing Senate Committee on Fisheries* (Ottawa: Standing Senate Committee on Fisheries, 2001) at 74 (Recommendation 14), online: Parliament of Canada <www.parl.gc.ca/37/1/parlbus/commbus/senate/com-E/fish-E/rep-E/interim-fish-e.pdf> .

242. This is not to say that precaution has been strongly embraced. For example, the Auditor General of Canada has severely criticized salmon farming controls on the Pacific coast where no salmon farm operator has been prosecuted under the *Fisheries Act* for release of a deleterious deposits, and where the Department of Fisheries and Oceans has done little to provide a scientific basis for setting criteria using the precautionary approach. See Auditor General of Canada, c. 30, "Fisheries and Oceans - The Effects of Salmon Farming in British Columbia on the Management of Wild Salmon Stocks," in *Report of the Auditor General of Canada to the House of Commons– December 2000* (Ottawa: Minister of Public Works and Government Services Canada, 2000), online: Office of the Auditor General of Canada <http://www.oag-bvg.gc.ca/domino/reports.nsf/html/0030ce.html/$file/0030ce.pdf> .

243. See British Columbia, Ministry of Agriculture, Food and Fisheries, News Release # 2002AGF0017-000697, "New Standards to be Set for Sustainable Aquaculture" (31 January 2002) online: Ministry of Agriculture, Food and Fisheries <http://www2.news.gov.bc.ca/nrm_news_releases/2002AGF0017-000697.pdf>. This, of course, may be viewed as reactionary not precautionary.

approaches.[244] The province has announced pilot projects aimed at pollution prevention including testing of closed containment systems with waste recovery and new diets that reduce the use of fish meal.[245]

However, British Columbia lifted the moratorium in September 2002, after developing what are alleged to be comprehensive environmental standards and practices.[246] Polarization of viewpoints has emerged over increasing the number of farms, and concerns include escaped Atlantic salmon competing with wild Pacific stocks and risks of spreading disease.[247] A strong precautionary voice has arisen for phasing out fish farming in open pens at sea.[248]

The details of how the precautionary approach might effect the regulation of genetically modified aquaculture products remain to be worked out. The Department of Fisheries and Oceans' *Aquaculture Policy Framework* does not specifically address the issue of the genetic modification of fish, but appears supportive

---

244. British Columbia, Environmental Assessment Office, "Consolidated List of Recommendations" in *Salmon Aquaculture Review Final Report*, vol. 1 (Victoria: Environmental Assessment Office, 1997), online: Environmental Assessment Office <http:www.eao.gov.bc.ca/project/aquacult/salmon/report/final/vol1/v1recs.htm> .

245. British Columbia, Ministry of Agriculture, Food and Fisheries, News Release #00-51, "New Aquaculture Regulations, Pilot Projects Approved" (4 October 2000), online: Ministry of Agriculture, Food and Fisheries <http://www.agf.gov.bc.ca/fisheries/regulation/NR51_aqua_reg.pdf> .

246. The original target for removing the moratorium was April 30, 2002 but a delay occurred due to the need to complete regulatory changes regarding aquaculture waste management. See British Columbia, Ministry of Agriculture, Food and Fisheries, *Applications for New Fish Farms Not Accepted April 30*, online: Ministry of Agriculture, Food and Fisheries <http://www.agf.gov.bc.ca/fisheries/application_delay.htm>. On September 12, 2002 the Government of B.C. announced it would begin accepting applications for new fin fish aquaculture sites. See British Columbia, Ministry of Agriculture, Food and Fisheries, *Salmon Aquaculture Policy Framework*, online: <http://www.agf.gov.bc.ca/fisheries/salmon_aqua_policy.htm>; British Columbia, Ministry of Agriculture, Food and Fisheries, News Release 2002AGF0018-000790, "New Standards Allow Sustainable Growth in Aquaculture" (12 September 2002), online: Ministry of Agriculture, Food and Fisheries <http://www2.news.gov.bc.ca/nrm_news_releases/2002AGF0018-000790.pdf> .

247. Mark Hume "Environmentalists Dog B.C. Fish Farmers" *National Post* (23 February 2002) A7. An emerging crisis is the drastic reduction of wild pink salmon spawners from over 3 million fish to 147 thousand fish in the Broughton Archipelago and the alleged link to sea lice infestations spread from salmon farms in the area. The Pacific Fisheries Resource Conservation Council (PFRCC), responsible for giving management advice regarding wild fish stocks, has called for application of the precautionary approach through either requiring the fallowing of all salmon farms in the Broughton Archipelago for a period before the wild stocks enter the region or developing a sea lice control plan which might include use of chemical therapeutants. See Pacific Fisheries Resource Conservation Council, *2002 Advisory: The Protection of Broughton Archipelago Pink Salmon Stocks*, Report to the Minister of Fisheries and Oceans and Report to the B.C. Minister of Agriculture, Food and Fisheries (November 2002), online: Pacific Fisheries Resource Conservation Council <http://www.fish.bc.ca/reports/pfrcc_broughton_advisory.pdf>. In a subsequent report, the PFRCC has recommended that the precautionary principle be applied in a much more rigorous way than is currently used in the evaluation of interaction risks between farmed and wild salmon stocks. See Pacific Fisheries Resource Conservation Council, *Advisory: Wild Salmon and Aquaculture in British Columbia*. Report to the Minister of Fisheries and Oceans Canada, Report to the Minister of Agriculture, Food and Fisheries, Report to the Canadian Public (January 2003), online: Pacific Fisheries Resource Conservation Council <http://www.fish.bc.ca/reports/pfrcc_wild_salmon_and_aquculture_2pdf>.

248. *Ibid.* The Leggatt Inquiry, funded by the David Suzuki Foundation, has recommended removal of all net-cage salmon farms from the marine environment by January 1, 2005 and application of the precautionary principle to regulation of the salmon farming industry. See The Honourable Stuart M. Leggatt, *Clear Choices, Clean Waters: The Leggatt Inquiry into Salmon Farming in British Columbia, Report and Recommendations* (Vancouver: Western Printers, 2001) at 23-24, 26, online: The Leggatt Inquiry <http://www.leggattinquiry.com/files/Leggatt_reportfinal.pdf>.

of technological innovations.[249] A Royal Society of Canada expert panel report on the future of food biotechnology in Canada, undertaken on behalf of Health Canada, the Canadian Food Inspection Agency and Environment Canada, recommended that "it would be prudent and precautionary to impose a moratorium on the rearing of GM fish in aquatic facilities"[250] because of the paucity of scientific information pertaining to genetic interactions between cultured and wild fish. The Department of Fisheries and Oceans, as part of the action plan of the Government of Canada in response to the Royal Society of Canada Report on Food Biotechnology, has pledged to develop specific regulations governing transgenic aquatic organisms.[251] The action plan indicates that the department agrees with the need to keep reproductively capable transgenic fish and transgenic aquatic organisms in secure land-based facilities.[252]

A *National Code on Introductions and Transfers of Aquatic Organisms*,[253] prepared by a federal-provincial Task Group on Introduction and Transfers, has been issued for assessing proposals to intentionally move aquatic organisms from one water body to another, including for aquaculture purposes.[254] The *Code* seeks to establish a standard set of risk assessment and approval procedures, and recognizes the precautionary approach as a guiding principle. It notes that if a risk assessment outcome is uncertain, priority should be given to conserving the productive capacity of the native resource.[255]

---

249. *DFO's Aquaculture Policy Framework, supra* note 241 at 9. The Policy states: "Government policy for aquaculture must recognize the significant potential for innovation in the aquaculture sector and the benefits such innovation will yield in a variety of disciplines."

250. Royal Society of Canada, *Elements of Precaution: Recommendations for the Regulation of Food Biotechnology in Canada* (Ottawa: Royal Society of Canada, 2001) at 167, online: <http://www.rsc.ca/foodbiotechnology/GMreportEN.pdf>.

251. Health Canada *et al.*, News Release, "Action Plan of the Government of Canada in Response to the Royal Society of Canada Expert Panel Report "Elements of Precaution: Recommendations for the Regulation of Food Biotechnology in Canada"" (23 November 2001) at 28 ["Action Plan"], online: Health Canada <http://www.hc-sc.gc.ca/english/pdf/RSC_response.pdf>. Meanwhile, any application for rearing a transgenic aquatic organism outside a contained research facility would depend on the approval process by Environment Canada under the *CEPA, 1999*, *supra* note 62 and its *New Substances Notification Regulations* S.O.R./1994-260.

252. "Action Plan," *ibid.* at 26. For a further description of the federal government's position and policy regarding genetically engineered fish, see Response of the Federal Departments and Agencies to the Petition Filed November 21, 2002 by Greenpeace Canada under the Auditor General Act (9 April 2002) online: Fisheries and Oceans Canada-Science <http://www.dfo-rmpo.gc.ca/science/aquaculture/biotech/greenpeace_e.htm>. For a recent review of Canada's approach to regulating genetically modified foods in light of precaution, see Canadian Biotechnology Advisory Committee, *Improving the Regulation of Genetically Modified Foods and other Novel Foods in Canada: Interim Report to the Government of Canada Biotechnology Ministerial Coordinating Committee* (Ottawa: Canadian Biotechnology Advisory Committee, 2001) at 23-36. The Committee noted the current paradigm for regulatory decisions pertaining to health and the environment is based on scientific evaluations and risk assessments and recommended further study and analysis to identify ways to address social and ethical issues related to biotechnology (*ibid.* at 45-47).

253. [Code], online: Fisheries and Oceans Canada <http://www.dfo-mpo.gc.ca/science/OAS/aquaculture/nationalcode/CodeJanuary2002-2.pdf>.

254. *Ibid.* at para. 1.1.4. The *Code* states that it does not cover issues relating to aquarium fish, baitfish, live fish for the food trade and transgenic aquatic organisms.

255. *Ibid.* at para. 2.2.8.

C. BIODIVERSITY (SPECIES AND HABITAT) PROTECTION

Unlike Australia,[256] Canada has not adopted broad biodiversity protection legislation, but has struggled since 1996 to enact a *Species at Risk Act*. Two bills were introduced in Parliament to protect species at risk—Bill C-65 in October 1996 and Bill C-33 in April 2000—but both died on the *Order Paper* upon dissolutions of Parliament due to election calls.[257] Bill C-5, the *Species at Risk Act*, received Royal Assent on 12 December 2002.[258]

The Act again demonstrates a rather wandering approach to precaution. The Act would embrace the precautionary principle in various ways, including a preambular reference[259] and a legal duty on ministers,[260] required to develop recovery strategies and action plans for endangered or threatened species, to consider the precautionary principle.[261] However, the legislation wanders away from a strong precautionary approach in various ways, including leaving the actual listing of species at risk to political discretion,[262] and the making of regulations to protect critical habitats to ministerial discretion.[263]

Canada has yet to develop detailed regulatory requirements for whale watching in accord with the precautionary approach. Existing *Marine Mammal Regulations*[264] under the *Fisheries Act* provide only a general obligation for persons not to disturb a marine mammal.[265] A recent report has documented the growing

---

256. *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

257. See Library of Parliament, Legislative Research Branch, *Bill C-5:The Species at Risk Act* (Legislative Summary LS-438E) by Kristen Douglas (Ottawa: Library of Parliament, 2002) at 5 ["Legislative Summary"], online: Parliament of Canada <http://www.parl.gc.ca/common/bills_ls.asp?lang=E&ls=c5&source=library_prb&Parl=37&Ses=2>.

258. *Ibid.* at 1. Bill C-5, *An Act Respecting the Protection of Wildlife Species at Risk in Canada*, 1st Sess., 37th Parl., 2001 was tabled in February 2001. The bill died on the *Order Paper* when Parliament was prorogued on 16 September 2002. By a motion adopted on 7 October 2002 the House of Commons provided for the reintroduction in the 2nd session of Parliament legislation that had not received Royal Assent in the previous session, and Bill C-5 was introduced and deemed to pass all stages in the House of Commons on 9 October 2002. See "Legislative Summary," *ibid.* at 5, 33 (footnote 1). The Bill received Royal Assent on 12 December 2002. S.C. 2002, c.29. The Act had not yet been proclaimed at the time of writing.

259. *Ibid.* The preamble states:
[T]he Government of Canada is committed to conserving biological diversity and to the principle that, if there are threats of serious or irreversible damage to a wildlife species, cost-effective measures to prevent the reduction or loss of the species should not be postponed for a lack of full scientific certainty....

260. See *e.g.* s. 8. The Minister required to lead protective efforts may vary, with the Minister of Canadian Heritage responsible for protecting species in national parks or other protected heritage sites, the Minister of Fisheries and Oceans responsible for aquatic species, and the Minister of the Environment responsible for all other individuals such as migratory birds. See s. 2(1), ("competent minister").

261. S. 38 provides:
In preparing a recovery strategy, action plan or management plan, the competent minister must consider the commitment of the Government of Canada to conserving biological diversity and to the principle that, if there are threats of serious or irreversible damage to the listed wildlife species, cost-effective measures to prevent the reduction or loss of the species should not be postponed for a lack of full scientific certainty.

262. S. 27 would leave listing largely to the discretion of the Governor in Council through the power to amend the List of Wildlife Species at Risk.

263. S. 59(1) provides: "The Governor in Council may, on the recommendation of the competent minister after consultation with every other competent minister, make regulations to protect critical habitat on federal lands".

264. S.O.R./1993-56.

265. *Ibid.* at s. 7.

scientific concerns over the effects of whale watching vessels on whale behavior and life processes, and has urged that more precautionary controls be imposed through regulation. For example, the report suggests limiting the number of vessels near whales, establishing distance and speed restrictions, and covering the duration of time any one vessel can spend in contact with an animal or group of marine mammals.[266] The Department of Fisheries and Oceans is soliciting views regarding possible amendments to the *Marine Mammal Regulations,* and intends to develop regulatory proposals for public discussion.[267]

v. Climate Change and Precaution

IN RESPONDING TO POTENTIAL THREATS OF CLIMATE CHANGE, Canada has perhaps displayed the most serious case of policy wanderings. The significant environmental risks associated with climate change, such as melting of sea ice in the Arctic[268] and the potential disastrous effects on wildlife like caribou[269] and polar bears,[270] would seem to raise the "classic case" of the need for strong precautionary actions.[271] However, Canada has wandered away from firm responses. The United Nations *Framework Convention on Climate Change*,[272] ratified by Canada in 1992,[273] endorses a weak "cost-effective" policy towards precaution as advocated

---

266. Jon Lien, "The Conservation Basis for the Regulation of Whale Watching in Canada by the Department of Fisheries and Oceans: A Precautionary Approach" (2001) Can. Tech. Rep. Fish. Aquat. Sci. 2363: vi + 38 p. at 13-14, online: Fisheries and Oceans Canada <http://www.dfo-mpo.gc.ca/communic/lien/intro_e.htm>.
267. See generally *ibid.*
268. See Eugene Linden Churchill, "The BIG Meltdown: As temperature rises in the Arctic, it sends a chill around the planet" *Time* (4 September 2000) 53 at 53. Sea ice in parts of the Arctic is reported to be up to 40% thinner than in 1980, and to cover 6% less area. See also Graham Ashford & Jennifer Castleden, *Inuit Observations on Climate Change: Final Report* (Winnipeg: International Institute for Sustainable Development, June 2001).
269. See Kate Jaimet, "Global warming 'lethal' to rare northern caribou" *The Ottawa Citizen* (30 November 2000) A4. Global warming may be contributing to wetter snowfalls and more freezing rain which lead to almost impenetrable crusts preventing caribou from foraging. Peary caribou on Bathurst Island in the High Arctic numbered about 3,000 in 1993 but four years later only some 75 remained.
270. See Pal Prestrud & Ian Stirling, "The International Polar Bear Agreement and the current status of polar bear conservation" (1994) 20 Aquatic Mammals 113 at 119-20. Prolonged ice-free periods may limit polar bear hunting of seals and may lead to declining body condition, lower reproductive rates and reduced survival of cubs.
271. David Freestone, "The Precautionary Principle" in Robin R. Churchill & David Freestone, eds., *International Law and Global Climate Change* (London: Graham & Trotman/Martinus Nijhoff, 1991) 38. See Government of Canada, "Regional Impacts: Climate Change in British Columbia," online: Government of Canada Climate Change <http://www.climatechange.gc.ca/english/issues/how_will/fed_bc.shtml>; Government of Canada, "Regional Impacts: Climate Change in Nova Scotia," online: Government of Canada Climate Change <http://www.climatechange.gc.ca/english/issues/how_will/fed_novascotia.shtml> . Effects of climate change on the Pacific and Atlantic coasts may also be serious, including declines in salmon stocks due to warmer water temperatures, inundation of wetlands, beaches and other sensitive coastal ecosystems, damage to coastal infrastructure and increases in toxic algae blooms.
272. *United Nations Conference on Environment and Development: Framework Convention on Climate Change*, 9 May 1992, 31 I.L.M. 849 (1992) [*Framework Convention*].
273. *United Nations Framework Convention on Climate Change*, 12 June 1992, Can. T.S. 1994 No. 7 (ratified by Canada 4 December 1992, entered into force 21 March 1994).

by the United States:[274]

> The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors....[275]

Although adopting a commitment under the Kyoto Protocol[276] to reduce greenhouse gas emission by 6% from 1990 levels during the commitment period 2008–2012, Canada has been criticized for trying to "weasel out" of emission reduction commitments. In climate change negotiations, Canada was a leading advocate for counting carbon dioxide soaked up by forests and soils (carbon sinks) against emission targets.[277] Federal Environment Minister David Anderson has fought hard to gain international acceptance for Canada receiving Kyoto credits for exporting clean-energy exports to the U.S. of natural gas and hydro-electric power.[278]

Canada has faced rough political seas in attempting to ratify and implement the Kyoto Protocol.[279] At a May 2002 meeting in Charlottetown, Prince Edward Island, provincial energy and environment ministers sought consensus with federal government proposals to meet Kyoto targets. Alberta expressed staunch opposition to strict Kyoto targets for reducing greenhouse gas emissions, and proposed to work at reducing emissions at a slower pace outside the Kyoto Protocol.[280] Alberta Environment Minister Lorne Taylor announced that his province would resign its position as co-chair of the National Climate Change Process Secretariat tasked with exploring ways to reduce greenhouse gases, but he indicated Alberta would still attend future federal-provincial meetings on climate change to promote a more business-friendly strategy.[281]

---

274. See James Cameron & Julie Abouchar, "The Precautionary Principle: A Fundamental Principle of Law and Policy for the Protection of the Global Environment" (1991) 14 B.C. Int'l & Comp. L. Rev. 1 at 12.
275. *Framework Convention, supra* note 272 at 854 (art.3(3)).
276. *Conference of the Parties to the Framework Convention on Climate Change: Kyoto Protocol*, 10 December 1997, 37 I.L.M. 22 (1998).
277. "Too Fearful to Act," Editorial, *The [Montreal] Gazette* (28 November 2000) B2; Cathy Wilkinson, *Negotiating the Climate: Canada and the International Politics of Global Warming* (Vancouver: David Suzuki Foundation, 2000), online: David Suzuki Foundation <http://www.davidsuzuki.org/files/negotiating.pdf>.
278. See *e.g.* Harry Sterling, "Kyoto: Lost in rhetorical smog" *The Globe and Mail* (8 May 2002) A21; Greenpeace Canada, News Release, "Liberals' ploy to weaken Kyoto with energy credits topic of Whistler meeting" (7 May 2002), online: Canada NewsWire <http://www.canadanewswire.ca/releases/May2002/07/c2598.html>.
279. For a critique of Canada's struggles, see David R. Boyd, *Up in the Air: Canada's Mixed Record on Ozone Depletion and Climate Change* (Vancouver: David Suzuki Foundation & University of Victoria, 2002), online: David Suzuki Foundation <http://www.davidsuzuki.org/files/Boyd_exec4.pdf>.
280. Steven Chase, "Alberta splits from Ottawa on Kyoto deal" *The Globe and Mail* (22 May 2002) A8.
281. *Ibid.*

In September 2002, when Prime Minister Jean Chrétien announced at the World Summit in Johannesburg Canada's intention to ratify the Kyoto Protocol and put the ratification decision to a vote in the Liberal-dominated House of Commons before the end of the year,[282] the Alberta government accused Mr. Chrétien of betraying the provinces by barrelling ahead without their consent, and indicated a preparedness to go to the Supreme Court of Canada[283] over issues of constitutional powers.[284] At the seventh joint meeting of the Ministers of Energy and Environment in Halifax on October 28, 2002, called to discuss a climate change draft plan presented by the federal government,[285] the provinces asked for a first ministers' conference before ratification to decide on a national policy on climate change. When the Prime Minister subsequently rejected the call for a first ministers' conference on the Kyoto accord, various premiers expressed outrage.[286] However, Nova Scotia Premier John Hamm, chair of the premiers' group on Kyoto, continued to discuss with Mr. Chrétien the 12 principles they would like to see incorporated into the national implementation plan.[287] Canada released a Climate Change Plan on November 21, 2002,[288] but federal-provincial meetings scheduled for November to discuss the plan were cancelled.[289] Many groups and industries remain strongly opposed to the Kyoto target and time frames.[290]

VI. Conclusion

TO DATE, CANADA HAS WADED AND WANDERED in the tricky currents of precaution. Only cautious steps have been taken to incorporate the precautionary principle into federal legislation, while the provinces and territories have hardly tested the legal waters. With the exception of ocean dumping control, Canada has largely wandered towards weak versions of precaution by emphasizing the need for "sound science" and cost-effectiveness, and giving primacy to short-term economic gain.

Given political, social and cultural differences in Canada, the precautionary principle will likely provide an on-going touchstone for discourses about

---

282. Steven Chase, "Chrétien aims for green legacy" *The Globe and Mail* (3 September 2002) A1.
283. *Ibid.* at A6.
284. For a discussion of the uncertain parameters of federal powers to implement the Kyoto Protocol, see Philip Barton, "Economic Instruments and the *Kyoto Protocol*: Can Parliament Implement Emissions Trading without Provincial Co-operation?" (2002) 40 Alta. L. Rev. 417.
285. Government of Canada, *Climate Change Plan for Canada: Climate Change: Achieving our Commitments Together* (Ottawa: Government of Canada, 2002), online: Government of Canada Climate Change <http://www.climatechange.gc.ca/plan_for_canada/plan/pdf/full_version.pdf>.
286. Robert Fife, "Premiers Enraged by Kyoto Snub" *National Post* (30 October 2002) A1.
287. Shawn McCarthy, "Hamm cites progress on Kyoto" *The Globe and Mail* (11 November 2002) A6.
288. Government of Canada, *Climate Change Plan for Canada*, online: Government of Canada Climate Change < http://www.climatechange.gc.ca/plan_for_canada/plan/index.html> .
289. See Dennis Bueckert, "Kyoto Meeting Called Off Again" *The [Halifax] Chronicle-Herald* (26 November 2002) A14; Bruce Cheadle, "Chrétien Criticized Over Kyoto" *The [Halifax] Chronicle-Herald* (27 November 2002) A11.
290. See *e.g.* Dennis Bueckert, "Opponents say Kyoto will cost families $2,700 a year" *The [Halifax] Chronicle-Herald* (13 November 2002) A1; Alan Toulin & Robert Benzie, "Kyoto Plan Is 'Foolish': Chamber" *National Post* (4 March 2002) A1; Alan Toulin, "Business, Chrétien spar over Kyoto" *National Post* (28 February 2002) A1.

ecosystem protection and broader public interests.[291] As noted by Stanley Fish, legal principles are not neutral but provide catalytic sources for interpretive arguments:

> Principles don't by themselves either aggravate or produce anything; principles never appear "by themselves" but are deployed and configured by partisan agents in particular situations. Principles, in short, are part of the arsenal or equipment of prudence, not an alternative to it.[292]

Tensions are certain to continue over the application of the precautionary principle. The extent to which the precautionary approach should be constrained by scientific research and traditional risk assessment is one area of contention.[293] The appropriate ethical viewpoint directing precautionary action is another issue, with various competing philosophies such as deep ecology favouring strong environmental rights, and utilitarian approaches embracing cost-benefit and risk-benefit analysis.[294]

Two jurisprudential currents are likely to combine with the precautionary principle in the future. First, other principles of sustainable development[295] are likely to synergize with precaution adding support for precautionary measures. For example, the ecosystem-based management approach, being increasingly called for in fisheries management and biodiversity conservation,[296] reinforces a number of precautionary directions such as the need to subject significant development proposals to ecological impact assessment and the need to broaden the establishment of Marine Protected Areas. The principle of intergenerational equity suggests the need to consider the long-term impact of development proposals, and to proceed cautiously in face of uncertainties over long-term environmental and human health effects. Second, evolving human rights norms, such as the right of children to a healthy environment and the right of indigenous peoples to environmental integrity, are likely to be used by advocates in combination with the precautionary principle to bolster arguments for strict forms of pollution control.[297]

Key questions remain. What necessary institutional innovations are politically realistic at the national and international levels to support precautionary

---

291. See Ellis, *supra* note 34.
292. Stanley Fish, *The Trouble with Principle* (Cambridge, Massachusetts: Harvard University Press, 1999) at 232.
293. See Bill Durodié, "Plastic Panics: European Risk Regulation in the Aftermath of BSE" in Morris, *supra* note 22, 140 at 161.
294. See Indur M. Goklany, *The Precautionary Principle: A Critical Appraisal of Environmental Risk Assessment* (Washington, D.C.: CATO Institute, 2001).
295. See generally Philippe Sands, "International Law in the Field of Sustainable Development: Emerging Legal Principles" in Winfried Lang, ed., *Sustainable Development and International Law* (London: Graham & Trotman/Martinus Nijhoff, 1995) at 53; Jon M. Van Dyke, "The Rio Principles and our Responsibilities of Ocean Stewardship" (1996) 31 Ocean & Coastal Mgmt. 1.
296. See Stuart M. Kaye, *International Fisheries Management* (Hague: Kluwer Law International, 2001) at 267-286.
297. See VanderZwaag, "Slippery Shores", *supra* note 6. For an overview of human rights and their relation to environmental protection, see Dinah Shelton, "Environmental Rights" in Philip Alston, ed., *Peoples' Rights* (Oxford: Oxford University Press, 2001) 185.

decision-making?[298] To what extent will the parameters of the precautionary principle be dictated through bureaucratic fiats and judicial decisions rather than determined through discursive processes?[299] Navigation through the tricky currents of precaution is likely to be a long and rough voyage.[300]

298. For example, a global regulatory body or discussion forum might be established for addressing unresolved conflicts over biotechnology. The latter has been suggested by Murphy, *supra* note 36. On the institutional challenges surrounding climate change, see Bruce Yandle, "The Precautionary Principle as a Force for Global Political Centralization: A Case-Study of the Kyoto Protocol" in Morris, *supra* note 22 at 167.

299. On the need for discursive procedures to foster social learning and to air differing values and interests, see Andy Stirling, "The Precautionary Principle in Science and Technology" in O'Riordan, Cameron & Jordan, *supra* note 64 at 61.

300. Federal coordinates for setting a course remain to be finalized. Environment Canada and Health Canada have been drafting a Guidance Document on *CEPA, 1999* and the Precautionary Principle, but a federal framework for applying the precautionary approach or principle has yet to be issued. For a critique of the limited progress on the precautionary principle, see *Report of the Commissioner*, *supra* note 174 at paras. 1.63-64.