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Canada's *Species at Risk Act* and Atlantic Salmon: Cascade of Promises, Trickle of Protection, Sea of Challenges

David L. VanderZwaag, Maria Cecilia Engler-Palma, Jeffrey A. Hutchings*

This article reviews through a three-part format the role and efficacy of the Species at Risk Act (SARA) in trying to save SARA-listed inner Bay of Fundy (iBoF) Atlantic salmon and other Atlantic salmon populations at risk from the brink of extinction. The cascade of SARA promises is first discussed, including: the independent assessment of the status of the species based on best available scientific information; the protection of listed species, their residences and critical habitat; and the two-stage recovery planning process. The trickle of protection actually delivered by SARA in relation to Atlantic salmon are next described, including the recent adoption of a Recovery Strategy and identification of critical freshwater habitat. The sea of challenges in implementing SARA and in strengthening the protective net outside SARA is finally highlighted. Particular challenges include: overcoming the slow implementation of the Act; addressing scientific limitations of the Recovery Strategy; forging a clear agenda for recovery actions; confronting limitations in incidental harm permitting; protecting critical habitat; getting a grip on protection and recovery of other Atlantic salmon populations at risk; bolstering environmental assessment; enhancing provincial engagement in recovery efforts; ensuring full implementation of Canada's Oceans Act; and charting future directions for the North Atlantic Salmon Conservation Organization.

Dans cet article, l'auteur examine, à l'aide d'une analyse en trois parties, le rôle et l'efficacité de la Loi sur les espèces en péril (la Loi) en ce qui concerne la conservation du saumon de l'Atlantique de l'intérieur de la baie de Fundy inscrite sur la Liste des espèces en péril de la Loi ainsi que d'autres populations de

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saumons qui sont en voie d'extinction. Tout d'abord, l'article présente les promesses contenues dans la Loi, incluant : l'évaluation indépendante du statut des espèces sur la base des meilleures informations scientifiques disponibles; la protection des espèces se trouvant sur la liste, de leur résidence et de leurs habitats essentiels et le processus de planification du rétablissement en deux étapes. Le peu de protection accordée dans les faits par la Loi relativement aux saumons de l'Atlantique est ensuite décrit, incluant la mise en place récente d'un programme de rétablissement et d'identification des habitats essentiels d'eau douce. Finalement, l'auteur discute de la multitude de défis présentés par la mise en œuvre de la Loi et par le renforcement de la protection offerte au-delà de la Loi. Certains défis consistent notamment à : surmonter la lenteur de la mise en œuvre de la Loi; résoudre les limitations scientifiques du programme de rétablissement; établir un échéancier précis pour les actions relatives au rétablissement; faire face aux permis pour dommages fortuits; protéger les habitats essentiels; prendre en main la protection et le rétablissement des autres populations de saumon de l'Atlantique qui sont en péril; améliorer l'évaluation environnementale; bonifier l'engagement des provinces relativement aux efforts de rétablissement; assurer la mise en œuvre complète de la Loi sur les océans du Canada; et établir les orientations futures de la North Atlantic Salmon Conservation Organization.

1. INTRODUCTION

Although Atlantic salmon was once an important commercial and recreational fishery, a spiritual component of traditional Aboriginal family and community,¹ and a centrepiece for thriving ecosystems,² today salmon populations are severely depressed and extirpated from many river systems in Europe and North America.³ By 1970, the species' production capacity had been reduced to 32 per cent of its estimated original productivity.⁴ Since 1970, salmon abundance has declined dramatically, and today stands at the lowest level known in history.⁵ According to a 2001 assessment, salmon have become extinct in 84 per cent of American rivers, and are critically endangered in the remaining 16 per cent.⁶

While Canada's prospects seem less bleak with several rivers containing

¹ Fisheries and Oceans Canada, *Recovery Strategy for the Atlantic salmon (Salmo salar), inner Bay of Fundy Populations [Final]* (Ottawa: Fisheries and Oceans, 2010) [hereafter *Recovery Strategy*] at 17; WWF, *The Status of Wild Atlantic Salmon: a River by River Assessment* (WWF, 2001), online: WWF <<http://assets.panda.org/downloads/salmon2.pdf>>, at 1-2.

² *Recovery Strategy*, *ibid.* at 17; and WWF, *ibid.* at 1-2.

³ WWF, *ibid.* at 2; COSEWIC, *COSEWIC Assessment and Update Status Report on the Atlantic Salmon Salmo salar (Inner Bay of Fundy populations) in Canada* (Ottawa: Committee on the Status of Endangered Wildlife in Canada, 2006) at 14, online: SARA Public Registry <www.sararegistry.gc.ca/status/status_e.cfm>.

⁴ Fred Whoriskey, "Management Angels and Demons in the Conservation of the Atlantic Salmon in North America" (2009) 70 *American Fisheries Society Symposium* 1083 at 1086.

⁵ WWF, *supra* note 1 at 2; Whoriskey, *ibid.* at 1086.

⁶ WWF, *ibid.* at 7.

healthy salmon populations, particularly in the northern range of the Canadian distribution, most Canadian salmon populations appear to be in various stages of decline.⁷ From 15 conservation units of anadromous Atlantic salmon reviewed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in Eastern Canada,⁸ five have been assessed as endangered;⁹ one threatened;¹⁰ four are of special concern;¹¹ four are not at risk;¹² and one population is considered to be data deficient.¹³

Among the populations at risk, the most serious is undoubtedly the case of inner Bay of Fundy (iBoF) Atlantic salmon. While the historical total abundance of iBoF Atlantic salmon has been estimated to likely have exceeded 40,000 adults earlier in the 20th century, there were less than 500 adults in 1998, less than 250 in 1999, and fewer than 100 in 2003.¹⁴ Analyses of data from two index rivers show an abundance decline between 1967 and 2000 of 99 per cent and between 92 per cent and 97 per cent, respectively.¹⁵ Most of the decline has occurred in the early and mid-1990s.¹⁶ Population projections under current conditions indicate a very high probability that, without human intervention, iBoF salmon in those index rivers will be extinct by 2012 and 2016, respectively.¹⁷ Extirpation had already been occurring in some rivers. Records of recreational catch indicate that 32 rivers within this region contained self-sustaining Atlantic salmon populations, another 10

⁷ WWF, *ibid.* at 84.

⁸ COSEWIC, *COSEWIC status report on Atlantic salmon Salmo salar (anadromous form) in Canada* (Ottawa: Committee on the Status of Endangered Wildlife in Canada, 2011) [in press]. Some populations of Atlantic salmon complete their entire life cycle in freshwater. They are known as landlocked populations. COSEWIC has reviewed only one purportedly landlocked designatable unit in Canada, the Lake Ontario, assessing it as extinct.

⁹ Inner Bay of Fundy; Anticosti Island population; Eastern Cape Breton population; Nova Scotia Southern Upland population; and Outer Bay of Fundy population (COSEWIC, *ibid.*).

¹⁰ South Newfoundland population (COSEWIC, *ibid.*).

¹¹ Inner St. Lawrence population; Gaspé-Southern Gulf of St. Lawrence population; Quebec Eastern North Shore population; and Quebec Western North Shore population (COSEWIC, *ibid.*).

¹² Southwest Newfoundland population, Northwest Newfoundland population, Labrador population and Northeast Newfoundland population (COSEWIC, *ibid.*).

¹³ Nunavut population (COSEWIC, *ibid.*).

¹⁴ COSEWIC, *supra* note 3 at 27; Peter Amiro, *Population Status of Inner Bay of Fundy Atlantic Salmon (Salmo salar) to 1999*, Can. Tech. Rep. Fish. Aquat. Sci. No. 2488 (2003).

¹⁵ Fisheries and Oceans Canada, *Recovery Potential Assessment for Inner Bay of Fundy Atlantic Salmon*, DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2008/050 (Dartmouth, NS: DFO Maritimes, 2008) [hereafter Recovery Potential Assessment], at 5. The two index rivers are the Stewiacke River, Nova Scotia, and the Big Salmon River, New Brunswick.

¹⁶ *Ibid.*

¹⁷ *Ibid.* at 8.

rivers and streams are reported to have produced salmon, and additional rivers are suspected to have contained salmon.¹⁸ However, juvenile surveys undertaken between 2000 and 2002 in 36 and 43 iBoF rivers, respectively, showed that juvenile Atlantic salmon were absent in nearly half of the rivers.¹⁹

With iBoF Atlantic salmon listed as endangered in Schedule 1 when the Canada's *Species at Risk Act*²⁰ (SARA) was enacted in 2002, and further salmon populations facing possible SARA listing, this article reviews through a three-part format the role and efficacy of SARA in trying to save salmon from the brink of extinction. Part 2 summarizes the cascade of SARA promises to protect species at risk, including prohibitions on taking endangered or threatened species and mandating the development of recovery strategies and action plans. Part 3 highlights the trickles of protection actually delivered by SARA in relation to Atlantic salmon, with a Recovery Strategy and identification of some critical river habitat being main accomplishments. Part 4 discusses the sea of challenges confronting the effective protection of Atlantic salmon, including the need to address limitations in SARA implementation, such as its slow pace, and the need to cast a stronger protective net outside SARA, for example, by fully implementing integrated management planning obligations under Canada's *Ocean Act*.²¹

This article does not explicitly address the statutory review process of SARA currently underway in the House of Commons, led by the Committee on Environment and Sustainable Development.²² However, a few thoughts regarding SARA amendment prospects are offered in the Conclusion.

2. SARA AND AQUATIC SPECIES: CASCADE OF PROMISES

The enactment of SARA in 2002 was a major step in Canada's commitment to the protection and preservation of Canadian biodiversity. The purposes of the Act are to prevent wildlife species from being extirpated or becoming extinct; to provide for the recovery of wildlife species extirpated, endangered, or threatened as a result of human activities; and to manage species of special concern to prevent them from becoming endangered or threatened.²³

SARA provides a cascade of promises to protect Canada's wildlife biodiversity. Those promises include an independent assessment of the status of the species based on best available scientific information; the protection of individuals, residences and their critical habitats; a formal and on-going recovery planning process; environmental assessment for impacts of projects to species at risk; substantial enforcement measures; and encouragement of financial support for recovery activities.

¹⁸ COSEWIC, *supra* note 3 at 15-16; Recovery Strategy, *supra* note 1 at 8-9.

¹⁹ COSEWIC, *ibid.* at 22; Recovery Strategy, *ibid.* at 20-21.

²⁰ S.C. 2002, c. 29 [hereafter SARA].

²¹ S.C. 1996, c. 31.

²² For more information on the SARA Statutory Review Process, see Parliament of Canada, House of Commons, Committee on Environment and Sustainable Development, online: Parliament of Canada <<http://www.parl.gc.ca/common/index.asp>>.

²³ SARA, s. 6.

The first of these promises is the separation of species' status assessment from the political decision of listing the species for legal protection. The assessment on the biological status of the species was entrusted to an independent expert committee — COSEWIC — which makes its decision on the basis of the best scientific information available, community knowledge and aboriginal traditional knowledge.²⁴ COSEWIC, indeed, had been established in 1977 and had already gained expertise and credibility in the assessment of wildlife species before SARA entered into force. The subsequent political decision of listing the species for SARA protection is rendered by the Governor in Council on the recommendation of the Minister of Environment.²⁵

A second promise of SARA is the immediate protection of listed endangered species and their residences through the automatic prohibitions included in ss. 32 and 33 of SARA. No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated, endangered or threatened species.²⁶ No person shall possess, collect, buy, sell or trade an individual of such wildlife species.²⁷ No person shall damage or destroy the residence of one or more individuals of such wildlife species.²⁸ These prohibitions apply automatically on federal lands, to aquatic species and to migratory birds protected by the *Migratory Birds Convention Act, 1994*.²⁹

A third promise of SARA is the protection and restoration of critical habitat.³⁰ A first requirement under SARA, in this respect, is the identification (to the extent possible) of the species' critical habitat in the recovery strategies or action plans.³¹ In addition, SARA offers a powerful, albeit not automatic, protection for identified critical habitat in s. 58: no person shall destroy any part of the critical habitat of any listed endangered or threatened species, or of any listed extirpated species if the recovery strategy has recommended the reintroduction of the species into the wild in Canada.³²

The fourth and perhaps most important promise of SARA lies in the recovery planning process for individual species or group of species. Recovery planning is a comprehensive two-stage process ensuring that all measures are adopted and all actions taken so as to prevent wildlife species from becoming extirpated or extinct,

²⁴ SARA, ss. 15(2).

²⁵ SARA, s. 27. Also see: A.Ø. Mooers *et al.*, "Science, Policy and Species at Risk in Canada" (2010) 60 *BioScience* 843 at 844-845; David L. VanderZwaag & Jeffrey A. Hutchings, "Canada's Marine Species at Risk: Science and Law at the Helm, but a Sea of Uncertainties" (2005) 36 *Ocean Devel. & Int'l L.* 219 at 221-22.

²⁶ SARA, ss. 32(1).

²⁷ SARA, ss. 32(2).

²⁸ SARA, s. 33.

²⁹ S.C. 1994, c. 22.

³⁰ Loss of habitat is often cited as the main cause of population decline in Canada and elsewhere. See e.g. Kate Smallwood, *A Guide to Canada's Species at Risk Act* (Vancouver, BC; Toronto, ON: Sierra Legal Defence Fund, 2003) at 27, online: Ecojustice <<http://www.ecojustice.ca/publications/reports>>.

³¹ SARA, ss. 41(1)(c) and 49(1)(a).

³² SARA, ss. 58(1).

or to recover wildlife that are extirpated, endangered, or threatened as a result of human activity. The two-stage process consists of a recovery strategy, which sets the general framework for recovery of the species,³³ and one or more action plans, which identify the specific measures to implement the recovery strategy.³⁴ The implementation of the recovery strategy and the progress towards meeting its objectives are subject to a mandatory review every five years.³⁵

Another promise of SARA relates to the assessment of potential negative environmental effects of proposed projects on species at risk, and the identification of possible mitigation measures. The authority responsible for ensuring that an assessment of environmental effects is undertaken under the *Canadian Environmental Assessment Act*³⁶ (CEAA) must notify the competent Minister if the project is likely to affect listed wildlife species or their critical habitat, and ensure that the effects of the project are avoided or lessened if the project is carried out.³⁷

SARA also provides extensive enforcement powers and measures³⁸ and potentially significant penalties for violators. Fines up to C\$1,000,000³⁹ for each individual of one or more species at risk involved in the offence can be imposed,⁴⁰ and up to five years of imprisonment.⁴¹

Finally, SARA encourages and supports stewardship activities contributing to the protection and recovery of species at risk and their habitat.⁴² Various federal funds have financially supported recovery activities.⁴³

33 A recovery strategy is required to describe the species and its needs; identify the threats to the survival of the species and the threats to its habitat; establish scientifically sound and credible population and distribution objectives that will assist the recovery and survival of the listed species at risk; identify the critical habitat to the extent possible, and/or a schedule of studies to undertake that identification; determine which additional information is required about the species; and establish a timeline for the completion of action plan or plans (SARA, s. 41).

34 An action plan is required to include: an identification of the species critical habitat, to the extent possible; a statement of the measures that are proposed to be taken to protect the species critical habitat; an identification of any portion of critical habitat that has not been protected; a statement on the measures to be taken to implement the recovery strategy and an indication as to when these measures are to take place; methods to monitor the recovery of the species; and an evaluation of socio-economic costs of the action plan and the benefits derived from its implementation (SARA, s. 49).

35 SARA, s. 46. The implementation of the action plans must also be monitored and assessed five years after plans come into effect (SARA, s. 55). Subsequent monitoring and reporting obligations are not explicitly considered.

36 S.C. 1992, c. 37 [hereafter CEAA].

37 SARA, ss. 79(1) and (2).

38 SARA, ss. 86–96.

39 SARA, s. 97.

40 SARA, s. 97(5).

41 SARA, s. 97.

42 SARA, ss. 11 to 13.

43 Those funds are the Habitat Stewardship Program for Species at Risk, the Interdepartmental Recovery Fund, the Aboriginal Capacity Building Fund, and the Aboriginal

3. SARA AND ENDANGERED ATLANTIC SALMON: TRICKLES OF PROTECTION

Since SARA's entry into force, its main protection mechanisms have been progressively but selectively implemented, as described in this part.

(a) Protecting Individuals and Residences: SARA Automatic Prohibitions

Although the main body of SARA entered into force on 5 June 2003, the entry into force of the prohibitions of s. 32 and 33 protecting individuals of species at risk listed in Schedule 1 of SARA, including iBoF Atlantic Salmon and their residences, was postponed until 1 June 2004.⁴⁴ Despite the seemingly powerful consequences that these prohibitions entail, particularly for aquatic species, fisheries activities for iBoF salmon were gradually prohibited until their complete ban even before its listing under SARA. Commercial fisheries in iBoF Rivers were closed after the 1984 season.⁴⁵ Recreational and aboriginal fisheries were closed in 1990, with the only exception of the Gaspereau River which remained open until 1994, and briefly reopened in 1996 and 1997.⁴⁶ In addition, s. 32 of the *Fisheries Act*⁴⁷ already prohibited the destruction of fish "by any means other than fishing except as authorized by the Minister or under regulations made by the Governor in Council" under the Act.

The limited practical consequences of the SARA prohibitions are confirmed by reviewing the enforcement of these provisions. To the best of our knowledge, there have been neither prosecutions nor convictions for violations to the SARA prohibitions with respect to iBoF Atlantic salmon.⁴⁸

Critical Habitat Protection Fund (online: SARA Public Registry <http://www.sararegistry.gc.ca/involved/funding/default_e.cfm>). Additionally, between 1998 and 2008 Environment Canada partnered with World Wildlife Fund WWF (Canada) to establish the Endangered Species Recovery Fund, supporting recovery activities for species at risk of extinction (online: WWF Canada <<http://wwf.ca/conservation/species/sarfo>>). The program ended in 2008 (*ibid.*).

⁴⁴ *Order Fixing the Dates of the Coming into Force of Certain Sections of the Act*, P.C. 2003-763, C. Gaz. 2003.II.1778 (*Species at Risk Act*).

⁴⁵ Recovery Strategy, *supra* note 1 at 16-17.

⁴⁶ *Ibid.*

⁴⁷ R.S.C. 1985, c. F-14.

⁴⁸ The information has been obtained from Fisheries and Oceans Canada Annual Reports to Parliament on the National Habitat Management Program, online: Fisheries and Oceans <<http://www.dfo-mpo.gc.ca/habitat/role/141/reports-rapports/index-eng.htm>>, SARA Annual Reports, online: SARA Public Registry <http://www.sararegistry.gc.ca/default_e.cfm>, and DFO Media Archives, Charges and Convictions, online: Fisheries and Oceans <<http://www.dfo-mpo.gc.ca/media/archive-eng.htm>>. Prosecutions under SARA do not appear to be frequent, with convictions to date being reported for violations involving only two aquatic species: Northern Wolf-fish and Abalone.

(b) Planning for Recovery: the Recovery Strategy and Statement for Action Planning

Advances for recovery planning have been made in three fronts: the overarching policy framework for recovery planning under SARA, the adoption of a Recovery Strategy for iBoF salmon, and the charting of the action planning stage.

While recovery strategy provisions in SARA are surrounded by considerable legal mist,⁴⁹ the federal government has progressively developed policy guidance clarifying several aspects of the content of Recovery Strategies and their implementation. Main policy documents include the draft *Overarching Policy Framework* posted on SARA Public Registry in December 2009,⁵⁰ and *Guidelines for Completing Recovery Strategy Templates (federal)* adopted in February 2006⁵¹ and updated in September 2010.⁵²

In this context of evolving policy guidance, advances were made with the elaboration of a Recovery Strategy for iBoF salmon. In 2000, a National Recovery Team for iBoF Atlantic was formed under the Recovery of Nationally Endangered Wildlife (RENEW) program, with the task to draft a Recovery Strategy. After the entry into force of SARA, it has continued its operation in support of the recovery planning and activities of iBoF Atlantic salmon. During these 10 years of work, more than 100 individuals, including representatives of federal and provincial government, Aboriginal communities, industry, NGOs, and academia, have participated in the recovery team, contributing their knowledge and expertise to the recovery planning process of iBoF Atlantic salmon.⁵³

The National Recovery Team delivered an early Recovery Strategy in 2002, which was not formally adopted because of the new and specific requirements for the recovery planning process that SARA demanded upon its passage by Parliament in December 2002. The Recovery Team devoted itself early on to the revision of the Recovery Strategy according to SARA provisions⁵⁴, a process that according to the new legislation should have been completed by 5 June 2006.⁵⁵ The process, however, was not concluded until April 2010 with the adoption of a SARA-compliant Recovery Strategy for iBoF Atlantic salmon, which was posted on the SARA Public Registry on May 4, 2010.⁵⁶

⁴⁹ VanderZwaag & Hutchings, *supra* note 25 at 231-32.

⁵⁰ Government of Canada, *SARA Policies: Overarching Policy Framework, Draft* (2009), online: SARA Public Registry <http://www.sararegistry.gc.ca/default_e.cfm>.

⁵¹ Government of Canada, *National Guidelines for Completing Recovery Strategies Templates* (February 7, 2006) (on file with authors).

⁵² Government of Canada, *National Guidelines for Completing Recovery Strategies Templates (federal)* (Sept. 2010) (on file with authors).

⁵³ A partial list of participants in the Recovery Team have been included in the 2002 *National Recovery Strategy for inner Bay of Fundy Atlantic (Salmo salar) salmon populations* (on file with authors) and in the 2010 Recovery Strategy, *supra* note 1.

⁵⁴ Fisheries and Oceans Canada, *Proceedings of the Maritimes Region Species at Risk Recovery Team Meetings of 2003*, DFO Can. Sci. Advis. Sec. Proceed. Ser. 2004/041 (Dartmouth, NS: DFO Maritimes, 2004), at 20.

⁵⁵ SARA, s. 42(2).

⁵⁶ Recovery Strategy, *supra* note 1.

The Recovery Strategy builds on the previous 2002 document but incorporates the new SARA requirements, adding important milestones in the recovery process of iBoF Atlantic salmon. The document starts by describing the general biology of species, distribution, population size and trends, legal protection and resource management, and cultural and economic significance. It includes a description of the main threats for the freshwater and marine cycle, including: changes in environmental conditions, ecological community shifts, contaminants, barriers to fish passage, aquaculture, illegal or incidental catches, and depressed population phenomena.⁵⁷

Based on this background information and analyses, the document concludes that salmon recovery is both biologically and technically feasible,⁵⁸ and sets an overall recovery goal and recovery targets. The Strategy identifies the overall recovery goal as to “re-establish wild, self-sustaining populations as required to conserve the genetic characteristics of the remaining anadromous iBoF Atlantic salmon.”⁵⁹ Population and distribution targets were set for the short (five years) and long term. The short term target is to:

Conserve the genetic characteristics of the few remaining anadromous iBoF Atlantic salmon populations in order to progress towards re-establishing self-sustaining populations to their conservation levels in the (. . .) 10 river systems that contribute to the LGB [live gene bank] program.⁶⁰

The long term target, in turn, has been defined as:

Conserve the characteristics of the few remaining anadromous iBoF Atlantic salmon populations in order to re-establish self-sustaining populations of iBoF Atlantic salmon to a conservation level of 9,900 spawning adults distributed throughout (. . .) 19 river systems.⁶¹

To achieve these short and long term targets, the Strategy identifies five prioritized recovery objectives: a) conserve iBoF Salmon genetic characteristics and re-establish self-sustaining populations to iBoF rivers; b) identify and remedy anthropogenic threats limiting survival and/or recovery of iBoF Salmon in the marine environment; c) identify and remedy anthropogenic threats limiting survival and/or recovery of iBoF Salmon in the freshwater environment; d) assess population status, sustainability, and recovery feasibility; and e) communicate and increase the general awareness of the status and recovery of iBoF salmon.⁶²

These five objectives have been further broken down into recovery approaches, and performance indicators have been established to assess the progress in achieving recovery objectives.⁶³ For example, the first objective has three associated approaches: provide salmon with appropriate genetic characteristics for recolonization of iBoF rivers designated for recovery; conserve the genetic character-

⁵⁷ *Ibid.* at 23–27.

⁵⁸ *Ibid.* at 28–29.

⁵⁹ *Ibid.* at 30.

⁶⁰ *Ibid.* at 30.

⁶¹ *Ibid.* at 31.

⁶² *Ibid.* at 32.

⁶³ *Ibid.* at 33.

istics of the residual population from the Chignecto Bay and the Minas Basin; and use Live Gene Bank strategies to conserve iBoF genetic characteristics and re-establish self-sustaining populations in iBoF rivers. The approaches associated to the second objective, in turn, are: to determine marine habitat quality, quantity and use by iBoF salmon populations; to preserve and recover marine habitat; to identify and evaluate marine threats that could limit iBoF salmon survival and/or recovery; and to reduce or mitigate marine threats that could limit iBoF salmon and/or recovery. The third objective is associated with four equivalent approaches, although with some differences in wording to adapt them to the freshwater environment.

The recovery targets articulated by the Strategy constitute positive trickles for recovering iBoF salmon. Foremost among these is the precise articulation of science-determined recovery targets. The long-term target of 9,900 spawning adults (estimated to represent 25 per cent of the abundance of iBoF salmon in the mid-20th Century) is scientifically sound and defensible, as are the six science-based criteria that were used to guide the selection of rivers to be allocated the highest priority in recovery efforts.⁶⁴

Another aspect of the Strategy that offers trickles of protection to iBoF Atlantic salmon is the limited number of activities with potentially harmful effects on this species at risk that are exempted from a s. 73 incidental harm permit or s. 74 authorization. Indeed, recovery strategies and action plans may exempt certain activities from the prohibitions of ss. 32, 33 and 58,⁶⁵ and potentially, these exceptions could represent a substantial interference with listed species.⁶⁶ The Strategy, based on the conclusions of the Recovery Potential Assessment considering that “under current conditions [when the LGB is operating], neither the probability of extinction nor the probability of recovery is very sensitive to low levels of human-induced mortality,”⁶⁷ adopts a restrictive approach to exempted activities. These include: scientific conservation and recovery activities led and authorized by Fisheries and Oceans Canada (DFO); research and recovery activities authorized by Parks Canada and undertaken within the Fundy National Park; and electrofishing for specific purposes.⁶⁸ Other activities likely to harm, harass, kill, capture or take

⁶⁴ The six criteria are: represent each of the three unique subunits (Minas Basin, Gaspeau River, and Chignecto Bay); include rivers with large areas of habitat (>10 per cent of the total measured area); include rivers with residual native populations that contribute to the LGB; represent local habitat variation within the Minas Basin and Chignecto Bay regions; include rivers with high productivity per unit area and productive capacity; and maintain metapopulation structure by increasing the number of rivers in which salmon are recovered (*ibid.* at 31).

⁶⁵ SARA, ss. 83(4).

⁶⁶ VanderZwaag & Hutchings, *supra* note 25 at 232.

⁶⁷ Recovery Strategy, *supra* note 1 at 50.

⁶⁸ The Recovery Strategy further qualifies the permitted research activities. According to the document, the scientific conservation and recovery activities led by DFO must be authorized by licence under ss. 52 and 56 of the *Fisheries (General) Regulations* and s. 4 of the *Fisheries Act*. Electrofishing must be authorized by licence under s. 52 of the *Fisheries (General) Regulations*, conducted by qualified individuals for the purposes of enforcement, environmental emergencies, mitigation for compensation and restoration projects or to fulfill the conditions of *Fisheries Act* authorizations or Letter of Advice.

iBoF Atlantic salmon would require a s. 73 permit or s. 74 authorization, which can only be issued once the pertinent procedural and substantive conditions are met.

The Recovery Strategy provides further trickles of protection by charting the future action steps of the recovery planning process. The Strategy states that it will be implemented through one or more action plans, each “outlining steps to be taken to implement the goals and objectives identified in the recovery strategy for the species.”⁶⁹ The first action plan shall be developed within four years of the posting of the Strategy, or at an earlier date. Priorities to be addressed are: a) the marine critical habitat; b) activities of the LGB program; and c) modifications to the Pet-titcodiac River causeway.⁷⁰

The Strategy further states, however, that even without formal action plans, it is expected that recovery actions will be undertaken for at least some of the recommended approaches outlined in the Strategy. Indeed, the Recovery Strategy itself lists a series of completed and underway actions,⁷¹ as well as a schedule of studies for the identification of critical habitat covering the period between 2008 and 2011,⁷² and a prioritization of recommended research and monitoring actions.⁷³ One of the key initiatives that is currently underway is the LGB program, the objective of which is to conserve iBoF Atlantic salmon genetic characteristics so as to allow for the re-establishment of self-sustaining populations in iBoF rivers once the causes of low marine survival are better understood and managed.

(c) Identifying and Protecting Critical Habitat

(i) Identification of Critical Habitat

The Recovery Strategy identifies some critical freshwater habitat for iBoF Atlantic salmon. It was considered unnecessary to identify all freshwater habitat as critical because of purported evidence that there is more freshwater habitat available than is required to achieve survival and recovery (although this evidence is neither presented nor cited in the document). The identified critical freshwater habitat consists of riffles, runs and staging or holding pools located below complete natural barriers in the 10 rivers (including their tributaries) that contain residual native populations of Atlantic salmon and that currently contribute to the LGB program.⁷⁴ Two of those rivers are located primarily inside the boundaries of Fundy National Park (FNP). The Strategy defines all parts of these two FNP rivers that are

The research and recovery activities undertaken within the Fundy National Park must be authorized by Parks Canada Agency under the *Canada National Parks Act* or another Act of Parliament and issued for purposes of sampling and collection of iBoF Salmon by various methods; tagging, tracking and release activities in support of the iBoF salmon live gene bank program; and habitat restoration and improvement activities in support of the conservation and recovery of iBoF salmon (*ibid.* at 50-51).

⁶⁹ *Ibid.* at 44.

⁷⁰ *Ibid.*

⁷¹ *Ibid.* at 45-49.

⁷² *Ibid.* at 42.

⁷³ *Ibid.* at 43-44.

⁷⁴ *Ibid.* at 36-37.

accessible to salmon as critical habitat, since “within the FNP there is no accessible river habitat that does not meet the physical description of critical habitat.” The amount of critical freshwater habitat in other iBoF salmon rivers is not quantified in the Strategy.

Following the identification of critical freshwater habitat, and pursuant s. 58(2) of SARA, Parks Canada has published in the Canada Gazette a description of the critical habitat within the Fundy National Park of Canada. This includes “all habitat accessible to iBoF Atlantic salmon within the sections of the Point Wolfe River, Bennett Brook, Hueston Brook, Upper Salmon River, Forty Five River and Broad River.”⁷⁵ The biophysical attributes of freshwater critical habitat were identified as “riffles, runs, and staging or holding pools found below complete natural barriers (i.e. waterfalls).”⁷⁶

The Recovery Strategy states that critical marine habitat was not identified because of lack of scientific knowledge on the migration routes and patterns of iBoF Atlantic salmon. A schedule of studies for 2008–2011 was included in the document, and the investigation of marine habitat use, including spatial and temporal use of habitats throughout the year and particularly in winter, was identified as a high-priority research recommendation.⁷⁷

(ii) Protection of Critical Habitat

Despite the fact that some critical habitat has been identified in the iBoF Atlantic salmon Recovery Strategy, this identification does not automatically trigger the prohibitions of s. 58. In the case of iBoF Atlantic salmon, the protection of critical habitat is subject to two regimes. With respect to the two FNP rivers, the Minister responsible for Parks Canada had the obligation to publish in the Canada Gazette a description of the critical habitat within the park within 90 days after the Recovery Strategy that identified it is included in the public registry. The competent Minister satisfied this obligation a few days later than statutorily required on August 7, 2010.⁷⁸ Protection for this part of the critical habitat occurs automatically 90 days after this publication, on 5 November 2010, through the prohibitions of s. 58(1).

In the case of the remaining critical habitat of aquatic species, protection can take two forms. Legal protection can occur through provisions in, or measures under, SARA or any other Act of Parliament, including agreements under s. 11; or protection can be invoked through an order under s. 58(1). Within 180 days of critical habitat identification, the competent Minister has the obligation to determine if the provisions in, or measures under,

⁷⁵ *Description of critical habitat of inner Bay of Fundy Atlantic salmon in Fundy National Park of Canada* (Parks Canada Agency), C. Gaz. 2010.I.2160 (*Species at Risk Act*).

⁷⁶ *Ibid.*

⁷⁷ Recovery Strategy, *supra* note 1 at 36 and 42-43.

⁷⁸ The statutory 90-day period expired on August 2, 2010.

SARA or any other Act of Parliament legally protect the critical habitat, or otherwise determine that the prohibitions of s. 58(1) are required. In the first case, he or she has the obligation to make a critical habitat protection statement setting out how the critical habitat is legally protected. In the second case, he or she has to make an order applying the prohibitions of s. 58(1). However, the Minister of Fisheries and Oceans has not met the 180-day period protection obligation following the identification of critical habitat in the Strategy. To date the Minister has not issued a s. 58 order nor included a critical habitat protection statement in the Public Registry.⁷⁹

(d) Fostering Stewardship for iBoF Atlantic Salmon Protection

The federal government has invested in recovery and habitat enhancement projects for species at risk through several federal funds. The Habitat Stewardship Program, established in 2000, has funded dozens of habitat enhancement projects, including 14 for iBoF Atlantic salmon.⁸⁰ The Interdepartmental Recovery Fund, between 2002 and 2009, funded 14 projects to enhance knowledge on iBoF Atlantic salmon and its critical habitat, although no projects have been funded since the 2009-2010 period.⁸¹ Additionally, a myriad of projects directed to increase knowledge on Atlantic salmon and its critical habitat, enhance Atlantic salmon habitat, and raise awareness of the status of the species, are funded periodically by private organizations and/or provincial governments.⁸²

4. PROTECTING ATLANTIC SALMON AT RISK: A SEA OF CHALLENGES

Numerous challenges stand in the way of protection and potential recovery of SARA-listed iBoF salmon and other Atlantic salmon populations considered at risk. Ensuring implementation of SARA promises is one main concern area, with

⁷⁹ The 180-day period was due on 31 October 2010.

⁸⁰ The list of funded projects is available online: Environment Canada <<http://www.ec.gc.ca/hsp-pih/default.asp?lang=En&n=015C4083-1>>.

⁸¹ The list of funded projects is available online: SARA Public Registry <http://www.sararegistry.gc.ca/involved/funding/irf_fir/search_e.cfm>.

⁸² The Recovery Strategy cites an “Activity Table” developed by DFO Science, Bedford Institute of Oceanography. The table is a summary of completed activities up to March 2008 and planned activities for April 2008–March 2009, cross-referenced to the specific objectives and strategies outlined in the Strategy. This table includes a number of projects and initiatives for, among others, scientific research, monitoring, and public awareness. Projects include a variety of institutions, including: DFO, Parks Canada, New Brunswick Department of Natural Resources, Fort Folly First Nation, Woodstock First Nation, Mi’kmaq Maliseet Nations, Ecology Action Center, Atlantic Salmon Federation, Dalhousie University, Memorial University, Guelph University, and University of British Columbia. (DFO, Bedford Institute of Oceanography, Key Results up to March 31, 2008 and Planned Activities from April 1, 2008 to March 31, 2009, online: <http://www.bio-iob.gc.ca/research/species_at_risk/ibof_salmon/Activities-Table-iBoF-Salmon-RS-Eng.pdf>).

key challenges being: overcoming slow SARA implementation; addressing scientific limitations of the Strategy; forging a clear agenda for recovery actions; confronting limitations in incidental harm permitting and authorizations; protecting critical habitat; getting a grip on future Atlantic salmon protection; and integrating the Strategy with broader policy and conservation efforts. Strengthening of the protective net outside SARA is also a major challenge, with a need to consider: bolstering environmental assessment; enhancing provincial engagement in aquatic endangered species protection; ensuring full implementation of Canada's *Oceans Act*; and charting future directions for the North Atlantic Salmon Conservation (NASCO).

(a) Ensuring Implementation of Existing SARA Promises

(i) Overcoming Slow SARA Implementation

One of the most important criticisms of SARA has been the slow implementation of its different provisions, including: listing, adoption of recovery strategies and action plans, and identification and protection of critical habitat.⁸³ Lag in implementation has also plagued different stages of the protection and recovery planning process for iBoF Atlantic salmon.

Although the listing process did not represent a problem for iBoF salmon because it was automatically included in Schedule 1 when SARA entered into force, that is not the case of nine other populations of Atlantic salmon that have been assessed as endangered, threatened, or special concern by COSEWIC in November

⁸³ Species at Risk Advisory Committee, *Presentation on the Species at Risk Act to the Standing Committee on Environment and Sustainable Development* (Spring 2009), online: Nature Canada <http://www.naturecanada.ca/endangered_sarac.asp>; David Suzuki Foundation, Ecojustice, Environmental Defence, and Nature Canada. *Canada's Species at Risk Act: Implementation at a Snail's Pace* (April 2009), online: Nature Canada <http://www.naturecanada.ca/endangered_atrisk_saraRC2009.asp>; A.Ø. Mooers, L.R. Prugh, M. Festa-Bianchet & J.A. Hutchings, "Biases in Legal Listing under Canadian Endangered Species Legislation" (2007) 21 *Conservation Biology* 572; C. Scott Findlay, Stewart Elgie, Brian Giles & Linda Burr, "Species Listing under Canada's *Species at Risk Act*" (2009) 23 *Conservation Biology*; VanderZwaag & Hutchings, *supra* note 25; and Mooers *et al.*, *supra* note 25. See also: Submission to the Commission for Environmental Cooperation pursuant to Article 14 of the North American Agreement on Environmental Cooperation, October 6, 2006, submitted by Sierra Club (U.S. and Canada), Nature Canada, The David Suzuki Foundation, Conservation Northwest, Environmental Defence, ForestEthics, Ontario Nature, Western Canada Wilderness Committee, BC Nature, Federation of Alberta Naturalists, the Natural History Society of Newfoundland and Labrador, Nature Nova Scotia and Nature Quebec to the Commission for Environmental Cooperation, online: CEC <http://www.cec.org/Page.asp?PageID=1226&SiteNodeID=210&BL_ExpandID=156>; Petition Nr. 61, 3 December 2002, to the Commissioner of Environment and Sustainable Development, and Commissioner of Environment and Sustainable Development, Status Report of the Commissioner of the Environment and Sustainable Development — March 2008, Chapter 12, both online: Office of the Auditor General, Environment and Sustainable Development <http://www.oag-bvg.gc.ca/internet/English/esd_fs_e_46.html>.

2010. The assessment will be communicated to the federal Minister of Environment in August 2011, which will trigger the legal requirement for the federal government to decide on its listing for protection. Fisheries and Oceans timelines for listing are particularly slow, likely as a consequence of the more powerful consequences of the listing decision on aquatic species.⁸⁴ If the current trends continue, the listing process for the nine new Atlantic salmon populations at risk could take at least two years. There is still also the risk that these populations will not be listed for protection, a decision that mostly depends on the socio-economic importance of the populations as commercial, recreational or aboriginal fisheries, as well as other economic activities that may have a negative impact on species at risk.⁸⁵

The iBoF salmon Recovery Strategy has been adopted with a considerable delay in relation to the statutory deadlines. SARA established a precise timeframe for the adoption of the Recovery Strategy: 5 June 2006. Nevertheless, the process took almost four years longer: the final Strategy was adopted in April 2010 and posted in the SARA Public Registry on May 4, 2010. The delay has been explained by the uncertainties surrounding the implementation of a new legislation, the extended consultations required in SARA, and the need to develop studies and analyses that Fisheries and Oceans did not have the opportunity to develop in a pre-listing stage.⁸⁶ However, the Strategy development can be characterized as excessively

⁸⁴ For analysis of bias in marine fish listing decisions, see Hutchings and Festa-Bianchet, *ibid.*; Mooers *et al.*, *ibid.*; Findlay *et al.*, *ibid.* The delays in the listing process of aquatic species can be explained by the fact that the prohibitions of s. 32 of SARA are applied to aquatic species wherever they occur, while in the case of terrestrial species they apply only on federal land. Because of the broader scope of the prohibitions, Fisheries and Oceans requires extended consultations and the undertaking of socio-economic analysis before the listing decision. Fisheries and Oceans Canada is responsible for 42 of the 53 “outstanding species” in the listing process, i.e. species that have been subject to an irregular listing process, which may include referral backs to COSEWIC or extended consultation processes. See 2010 *Report of Outstanding Species at Risk* (last update 10 June 2010), online: SARA Public Registry <http://www.sararegistry.gc.ca/sar/assessment/batchreporhtml_0510_e.cfm>. The practice of DFO to undertake socio-economic impact analyses at this stage of the process, a practice that has been noted elsewhere (Stratos Inc. *Formative Evaluation of Federal Species at Risk Programs: Final Report* (Ottawa, ON: 2006), online: Environment Canada <<http://www.ec.gc.ca/ae-ve/default.asp?lang=en&n=53869FF3-1&printerversion=true>>).

⁸⁵ From 16 species not listed, 15 are under the responsibility of DFO. This number does not include species that have not been listed because of a decision to undertake extended consultation processes or to refer the assessment back to COSEWIC, which is the case of emblematic species like the Polar and Grizzly Bears. Furthermore, the Governor in Council has recently proposed not to list another 3 aquatic species: Lake Winnipeg Physa Snail, Boccaccio, and Canary Rockfish (*Order Amending Schedule 1 to Species at Risk Act (Proposed Regulatory Text)*, C. Gaz. 2010.I.3227). The reason provided in most cases is the economic and social impact of the listing decision.

⁸⁶ The Recovery Strategy is supported by several scientific documents prepared by the DFO science branch and subject to the DFO Science Advisory Process Framework, which may include external peer review. That is the case of the Recovery Potential Assessment, *supra* note 15, and a series of working papers, published as research docu-

long. The process had already started well before SARA was enacted with the establishment of a recovery team and a first version of a Recovery Strategy was already prepared in 2002.

The schedule for the next steps of the recovery planning process is equally slow paced. The first action plan is expected to be prepared within four years.⁸⁷

This timeframe can be questioned both on scientific and policy grounds. From a scientific perspective, four years represent more than one generation of the endangered population.⁸⁸ Furthermore, the Recovery Potential Assessment estimates that, in the absence of human intervention and if the conditions responsible for the decline remain unchanged, iBoF Atlantic salmon may be extirpated from two index rivers as early as 2012 and 2016, respectively.⁸⁹ Expecting a first action plan only by 2014 is out of tune with the imminent extirpation of these populations from main rivers in its range of distribution. From a policy perspective, the schedule seems also inconsistent with the implicit structure of the recovery planning process in SARA. Indeed, according to SARA the implementation of the Recovery Strategy has to be assessed after five years of the time it was posted on the Public Registry. In the best of cases, however, the action plan would have only been adopted a year earlier and would still be in the early implementation stage. Furthermore, according to SARA, the action plan must include “a statement of the measures that are to be taken to implement the recovery strategy.”⁹⁰ Thus, the actual action for recovery is not taken but just outlined in the action plan; and the real hands-on work lies further down the road.

The Recovery Strategy is quick to emphasize that there is no need to wait for the adoption of formal plans to begin or continue recommended approaches outlined in the document. Indeed, the ongoing activities cover the main priorities for action plans identified in the same Strategy: Petitcodiac River causeway removal, the LGB program, and marine habitat research. If those activities were already identified, planned and begun, it is then puzzling that the preparation of the first action plan is expected to take four years.

Implementation timeliness has also been an issue in critical habitat protection.

ments, addressing the specific topics of population viability analysis, threats, and habitat issues. See: A.J.F. Gibson, H.D. Bowlby, J.R. Bryan & P.G. Amiro, *Population Viability Analysis of inner Bay of Fundy Atlantic Salmon with and without Live Gene Banking*, DFO Can. Sci. Advis. Sec. Res. Doc. 2008/057 (Dartmouth, NS: Fisheries and Oceans Maritime Region, 2008); Peter G. Amiro, John C. Brazner & Jennifer L. Giorno, *Assessment of the Recovery Potential for the Atlantic Salmon Designatable Unit Inner Bay of Fundy: Threats*, DFO Can. Sci. Advis. Sec. Res. Doc. 2008/059 (Dartmouth, NS: Fisheries and Oceans Maritime Region, 2008); and Peter G. Amiro, John C. Brazner & Jennifer L. Giorno, *Assessment of the Recovery Potential for the Atlantic Salmon Designatable Unit Inner Bay of Fundy: Habitat Issues*, DFO Can. Sci. Advis. Sec. Res. Doc. 2008/058 (Dartmouth, NS: Fisheries and Oceans Maritime Region, 2008).

⁸⁷ Recovery Strategy, *supra* note 1 at 44.

⁸⁸ The best estimate of generation time for iBoF Atlantic salmon is 3.7 years (COSEWIC, *supra* note 3 at 19).

⁸⁹ Recovery Potential Assessment, *supra* note 15 at 8.

⁹⁰ SARA, s. 49(1)(d).

To date, the Minister of Fisheries and Oceans has not fulfilled its legal obligations under s. 58 and has not issued either a critical habitat protection statement or the critical habitat protection order for iBoF Atlantic salmon within the statutory 180-day timeframe.

(ii) Addressing Scientific Limitations of the Recovery Strategy

The Strategy does not set out a comprehensive (even moderately so) scientific basis for meaningful recovery actions that adequately reflects the breadth of available scientific research and opinion. The Strategy includes 104 references, 51 (49 per cent) of which were authored by Fisheries and Oceans' personnel. An ISI Web of Science search for "Atlantic salmon" (as topic) and "Canada" (as address) yielded 2488 publications, 770 (31 per cent) of which included co-authors whose address included "Fisheries and Oceans." One could argue that the proportional representation of publications in the Recovery Strategy co-authored by DFO personnel might have been expected to have been lower and reflective of the proportional representation of DFO science contributions to the study of the species. Further limitations on the scientific breadth of the Strategy may be reflected by the observation that 19 of the DFO's 51 (37 per cent) contributions were co-authored by the same individual.

The Strategy also inadequately reflects recent scientific research, where "recent" could be defined as research published in the past six years (the criterion used by Canada's national funding agencies for research in the natural and social sciences). Using 2004 as the baseline year for the 2010 Strategy, 26 of 104 (25 per cent) publications could be defined as "recent." However, of these 26 papers, 21 were co-authored by DFO personnel, again suggesting a bias in the research cited in support of the information provided in the Strategy. The most recent publication year for a cited document is 2008, all of which were co-authored by DFO personnel.

Any citation bias in the Recovery Strategy towards research undertaken by non-DFO personnel is almost certainly unintentional. The bias is likely reflective of the research backgrounds and scientific affiliations of the individuals who participated in the development of the document. While a bias is explicable, it does not render the bias acceptable.

A further aspect of concern in the content of the Strategy is the lack of explicit and clear description of the state of the scientific knowledge in some particular areas. One example is the research milieu on threats to wild salmon populations resulting from aquaculture, a subject matter that is surprisingly under-represented in the Strategy. Since the first international symposium on the topic (specific to Atlantic salmon) in Loen, Norway, in 1989,⁹¹ there have been enormous advances in the knowledge of the consequences of, for example, interbreeding between wild and farmed salmon, yet little of this is evident in the Strategy. One might conclude, based on the citations in the document, that much remained to be learned on this

⁹¹ L.P. Hansen, T. Håstein, G. Naevdal, R.L. Saunders & J.E. Thorpe, eds., *Interactions between cultured and wild Atlantic salmon. Proceedings of a symposium hosted by the Directorate for Nature Management and Norwegian Institute for Nature Research held in the Hotel Alexandria; 23–26 April 1990; Loen, Norway* (1991) 98 Aquaculture 1.

topic and that it was too early to undertake appropriate risk assessments resulting from this COSEWIC-identified threat to iBoF salmon. Missing among the citations in the Strategy are key reviews in this area, including those by Weir and Grant in 2005,⁹² Tymchuk and Devlin in 2005, 2006 and 2007,⁹³ and Hutchings and Fraser in 2008,⁹⁴ among others. Indeed, further research in this area is identified as a “knowledge gap” and as a topic of high-priority research.

Various windows exist for addressing the scientific limitations evident in the Strategy. A specific action plan on further scientific research priorities and activities might be developed. The Strategy itself might eventually be strengthened on the scientific front as SARA requires periodic 5-year reviews.

(iii) Forging a Clear Agenda for Recovery Actions

A key challenge for iBoF recovery is to ensure that effective, timely and precautionary recovery actions are adopted and implemented. The Recovery Strategy, however, surrounds the action planning stage with considerable mist by including a limited identification of recovery approaches and an inadequate description of the action planning stage.

The iBoF Salmon Strategy identifies a number of approaches associated with each objective that provide “both the direction and flexibility” for achieving the iBoF salmon recovery targets.⁹⁵ These approaches have been worded at a high level of generality,⁹⁶ emphasizing two main broad strategic directions: the use of

⁹² Laura K. Weir & James W.A. Grant, “Effects of aquaculture on wild fish populations: a synthesis of data” (2005) 13 *Environmental Review* 145.

⁹³ W.E. Tymchuk & R.H. Devlin, “Growth differences among first and second generation hybrids of domesticated and wild rainbow trout (*Oncorhynchus mykiss*)” (2005) 245 *Aquaculture* 295; Wendy E. Tymchuk, Carlo Biagi, Ruth Withler & Robert Devlin, “Growth and behavioral consequences of introgression of a domesticated aquaculture genotype into a native strain of coho salmon” (2006) 135 *Transactions of the American Fishery Society* 442; Wendy E. Tymchuk, L. Fredrik, Sundström & Robert H. Devlin, “Growth And Survival Trade-Offs And Outbreeding Depression In Rainbow Trout (*Oncorhynchus mykiss*)” (2007) 61 *Evolution* 1225.

⁹⁴ Jeffrey A. Hutchings & Dylan J. Fraser, “The nature of fisheries- and farming-induced evolution” (2008) 17 *Molecular Ecology* 294.

⁹⁵ Recovery Strategy, *supra* note 1 at 32.

⁹⁶ The clearest example of the general wording of the approaches is given by the common approaches provided to the second and third objective of the Strategy: identify and remedy anthropogenic threats limiting survival and/or recovery of iBoF salmon in the marine environment and in the freshwater environment (*ibid.* at 33). The approaches include “Identification and evaluation” and “reduction and mitigation” of both marine and freshwater threats, without an explicit reference to specific anthropogenic threats already identified in the Strategy. Some further details have been given in a subsequent section of knowledge gaps and research and monitoring recommendations, emphasizing the research approaches rather than the management approaches (*ibid.* at 43). This emphasis probably reflects the Strategy’s conclusion that “the factors that have caused the collapse of wild Atlantic salmon populations in the iBoF since 1980s are not well understood” (*ibid.* at 23).

the LGB program to maintain population diversity;⁹⁷ and research priorities and recommendations directed to a better understanding of factors that have caused the collapse of wild Atlantic salmon.⁹⁸

The Strategy does not include strategic approaches for the management of identified threats limiting iBoF salmon, which is remarkable since preparatory working documents, including the Recovery Potential Assessment, had already identified many mitigation measures and alternatives for several of the iBoF salmon threats.⁹⁹ Those working documents suggested among other mitigation measures for aquaculture interactions: improved containment; contingency plans and reporting systems for escaped fish; improved fish health management; improved effluent management; improved risk assessment to determine appropriate donor stock; use of sterile fish; and use of predator nets.¹⁰⁰ Suggested mitigation measures for fisheries interactions included season, area and gear restrictions to reduce incidences of iBoF salmon capture; and the definition of ecosystem objectives that include iBoF Atlantic salmon for management purposes.¹⁰¹ To counter freshwater environmental threats, the Recovery Potential Assessment suggested enhancing and formalizing the risk-based management approach for review of development proposals in and around iBoF habitat pursuant the habitat provisions of the *Fisheries Act*, SARA and CEAA; and increasing management and tracking of cumulative effects, including water extractions.¹⁰² Further mitigation measures were suggested for contaminant impacts, *e.g.* application of best management practices for agriculture, forestry and other industries to reduce or minimize herbicide and pesticide runoff, and for physical barriers to fish passage.¹⁰³

Although uncertainties surrounding the nature and timeline for management actions for recovery of iBoF salmon could be addressed at the action planning stage, this is an area where the lack of legal and policy guidance and the hazy statement of the Recovery Strategy leave considerable discretion to Fisheries and Oceans Canada. SARA does not address the process, timing, or implementation mechanisms of action plans, and only outlines main required contents.¹⁰⁴ These include: identification and protection of critical habitat;¹⁰⁵ the measures to implement the recovery strategy and their timeline;¹⁰⁶ methods to monitor recovery and long-term viability of the species;¹⁰⁷ and evaluation of the socio-economic costs

97 *Ibid.* at 32-33.

98 *Ibid.* at 33-34 and 43.

99 See: Recovery Potential Assessment, *supra* note 15; Amiro i, *Can. Sci. Advis. Sec. Res. Doc. 2008/059*, *supra* note 86.

100 Recovery Potential Assessment, *ibid.* at 22.

101 *Ibid.* at 22-23.

102 *Ibid.* at 23.

103 *Ibid.*

104 VanderZwaag & Hutchings, *supra* note 25 at 231-32.

105 SARA, s. 49(1)(a) to (c).

106 SARA, s. 49(1)(d).

107 SARA, s. 49(1)(d.1).

and benefits.¹⁰⁸ The Governor in Council may prescribe further contents by regulations, but to date this regulatory power has not been exercised.¹⁰⁹

The SARA Overarching Policy Framework does not offer specific recommendations for action planning, but addresses action plans together with strategies under the recovery planning process.¹¹⁰ No specific guideline for action plan templates has been developed so far. The Guidelines for Completing Recovery Strategy Templates only provide guidance on the length of the action plan statement, recommending it to be a sentence length.¹¹¹ Both DFO and Park Canada have provided further written suggestions that are particularly brief: “An action plan or xx action plans will be completed by [month YY].”¹¹²

The iBoF Salmon Strategy follows the minimal content suggested in the guidance. The Strategy states that “It is expected that one or more action plans for this species will be developed, each outlining steps to be taken to implement the goals and objectives identified in the recovery strategy for the species.”¹¹³ The document adds that “several priorities that have been identified thus far to be potentially considered during the action planning process include addressing marine critical habitat, the activities of the LGB program and modifications to the Petitcodiac River causeway.”¹¹⁴

Thus, the Strategy leaves Fisheries and Oceans Canada to decide how many action plans need to be developed, and their content. Also left to Fisheries and Oceans discretion is the timeline for drafting these action plans. The Strategy only states that the first of one or many action plans with undefined content will be produced within four years.

This approach follows a narrow interpretation of SARA ss. 41(1)(g), which requires “a statement of when one or more action plans in relation to the recovery strategy will be completed.” The requirement of the timeline is understood to apply to one action plan even if the Strategy requires or recommends more than one. A broader interpretation of this provision is that the Strategy requires a comprehensive timeline for the action planning stage, including all action plans.

(iv) Confronting Limitations in Incidental Harm Permitting and Authorizations

A further challenge for the iBoF salmon recovery process is the need to confront three main limitations in the design and implementation of incidental harm permitting: the lack of policy and scientific guidance for issuing permits and authorizations; the non-precautionary basis for allowing some incidental human-induced mortality; and the limited application of these SARA provisions. Each of those lim-

¹⁰⁸ SARA, s. 49(1)(e).

¹⁰⁹ SARA, ss. 29(1)(f) and 49(2).

¹¹⁰ *Supra* note 50 at 24–30. There is only one paragraph particular to action plans, which addresses socio-economic considerations (*ibid.*, para. 4.9 at 30).

¹¹¹ *Supra* note 52 at 22.

¹¹² *Ibid.* at 23–24.

¹¹³ Recovery Strategy, *supra* note 1 at 44.

¹¹⁴ *Ibid.*

itations is explained after a summary of the incidental harm permitting provisions of SARA.

A. Understanding Incidental Harm Permitting

While killing, harming, harassing, capturing or taking any individual of iBoF Atlantic salmon is prohibited by SARA, the legislation gives the competent Minister the power to allow activities having that negative effect under a s. 73 agreement or permit, subject to several procedural and substantive conditions. The need for an agreement or permit applies both to existing activities or new developments, since SARA does not provide for the “grandfathering” of harmful activities.

From a substantive perspective, s. 73 requires that the activity be:

- a) scientific research relating to the conservation of the species and conducted by qualified persons;
- b) beneficial for the species or required to enhance its chance of survival in the wild; or
- c) incidental in the affect on the species.

Additionally, before issuing the permit the Minister must further be of the opinion that:

- d) all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted;
- e) all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals; and
- f) the activity will not jeopardize the survival or recovery of the species.

Procedurally, it is required that agreements and permits are not issued for a term longer than five and three years, respectively; and that an explanation of why the agreement was entered into or the permit issued is included in the SARA Public Registry.

Alternatively, and according to s. 74 of the Act, an agreement, permit, licence, order or other similar document authorizing a person or organization to engage in an activity affecting a listed wildlife species or the residences of its individuals, issued or made by the competent Minister under another Act of Parliament has the same effect as an agreement or permit under s. 73, provided that the Minister is satisfied that the substantive and procedural conditions of s. 73 have been met.

B. Addressing the Lack of Policy and Scientific Guidance for Permits and Authorizations

The incidental harm provisions of SARA have several elements of uncertainty and of ministerial discretion not subject to either substantive or procedural checks.¹¹⁵ A key source of uncertainty is the lack of definition of the concept of jeopardy to survival and recovery.¹¹⁶ Policy guidelines have not addressed the in-

¹¹⁵ VanderZwaag & Hutchings, *supra* note 25 at 228 and 244.

¹¹⁶ *Ibid.* at 228.

terpretation of jeopardy. DFO has adopted the policy of relying on allowable harm assessments or recovery potential assessments to evaluate the scope for harm under s. 73 of SARA.¹¹⁷ In the case of the iBoF Atlantic salmon, the conclusion of the Recovery Potential Assessment, adopted by the Recovery Strategy, is that “low levels of human-induced mortality have little effect on the probability of extinction when the LGB is operating, even at very low levels of at-sea survival.”¹¹⁸

Neither the Recovery Potential Assessment nor the Strategy defines what constitutes a “low” level of human-induced mortality, nor do they define what is meant by “very sensitive” when referring to the impacts of this mortality on salmon. Therefore, both documents missed the opportunity to fill the gap of legal and policy documents and provide clear guidance on the interpretation of the concept of “jeopardy” and the threshold of allowable harm for iBoF salmon.

C. Confronting the Non-Precautionary Basis for Allowable Harm Assessment

The rationale for considering that low levels of human-induced mortality have little effect on the probability of extinction is made on the basis that the LGB program is operating. The LGB program is, therefore, essentially being identified as the mitigative activity that permits iBoF salmon to experience harm (under current levels of salmon mortality at sea). This is surprising given that the LGB program, notwithstanding its potential merits, has not yet proven to be an effective strategy in recovering iBoF salmon. Indeed, a comprehensive review of the ability of captive breeding programs to conserve salmonid biodiversity, not cited by the Strategy, concluded that the loss of fitness (including genetic variability) in captivity can be rapid and that there is “currently little evidence that captive-bred lines of salmonids can or cannot be reintroduced as self-sustaining populations.”¹¹⁹ Given the uncertainty in the potential effectiveness of the LGB program, one would think that its identification as the sole mitigative action that permits harm to be experienced by iBoF salmon is non-precautionary from a species-at-risk perspective and inconsistent with the objectives of SARA.

D. Ensuring Ample Implementation of Incidental Harm Provisions

Another concern is the limited implementation of incidental harm permits as the mechanism to ensure that activities will not have a detrimental impact on iBoF Atlantic salmon. The SARA Public Registry has included to date 48 s. 73 permits and two s. 74 authorizations.¹²⁰ All s. 73 permits have been issued by DFO, while

¹¹⁷ See: Fisheries and Oceans Canada, *Revised Framework for Evaluation of Scope for Harm under Section 73 of the Species at Risk Act*, DFO Can. Sci. Advis. Sec. Stock Status report 2004/048 (Ottawa: DFO, 2004); Fisheries and Oceans Canada, *Practitioners Guide to the Species at Risk Act (SARA) for Habitat Management Staff* (draft) (March 2006) (on file with authors) at 45-46.

¹¹⁸ Recovery Potential Assessment, *supra* note 15 at 26.

¹¹⁹ Dylan Fraser, “How Well Can Captive Breeding Programs Conserve Biodiversity? A Review of Salmonids” (2008) 1 *Evolutionary Applications* 535.

¹²⁰ Information provided by SARA Public Registry as to April 24, 2011. One permit was issued in 2005, one in 2007, 18 in 2008, 19 in 2009, and 11 in 2010.

the two s. 74 authorizations were issued by Park Canada. These permits and authorizations were issued to undertake scientific research on iBoF Atlantic salmon, research on other species, fish surveys in preparation of environmental assessments or monitoring programs, and habitat enhancement projects.

The SARA Public Registry has not included any permit for activities explicitly identified as threats for the species in the Recovery Strategy, including aquaculture, tidal barriers and by-catch fishing. There appears to be an obvious inconsistency between the scientific assessment of what is threatening iBoF Atlantic salmon, and the use of the SARA tools to ensure that those threats are analyzed, their impacts avoided or lessened, and the harmful activities properly monitored.

(v) *Protecting Critical Habitat*

Since the provisions for protection of critical habitat are the most complex in the Act, reflecting multi-jurisdictional authorities and the complementary nature of SARA,¹²¹ a first challenge in critical habitat protection is to clarify the scope and content of the federal obligations under SARA. Particular challenges in this respect are the uncertainties in SARA provisions, limited policy guidance, almost non-existent implementation, and ongoing judicial review.

Because Fisheries and Oceans Canada has not implemented s. 58 of SARA in relation to iBoF salmon, critical habitat is currently protected through the provisions of the *Fisheries Act*, which impose further challenges to critical habitat protection. These challenges include: the discretionary nature of the *Fisheries Act* protection to fish habitat; the purported illegality of Fisheries and Oceans implementation procedures; the lack of effectiveness of the fisheries habitat protection provisions; the limitations in their scope; and their limited practical implementation.

A. Sorting Out SARA Critical Habitat Protection Requirements for Aquatic Species

SARA's provisions on critical habitat protection require the Minister to determine, 180 days after the critical habitat identification, whether critical habitat is "legally protected" by provisions in, or measures under, SARA or any other Act of Parliament. It does not define, however, what "legal protection" means.

This vacuum has not been filled with policy guidance. SARA's *Overarching Policy Framework* addresses protection of critical habitat in a few short paragraphs, mostly to recommend that critical habitat be protected by the use of existing provisions in, or measures under, other Acts of Parliament.¹²² Only where those measures do not exist, the use of agreements under s. 11, s. 58 prohibitions, or regulations made under s. 59, is encouraged.¹²³

The provisions have had very limited implementation. To date, critical habitat protection statements have been posted for only five species (including three

¹²¹ SARA, preamble, para. 4 and 6.

¹²² *Supra* note 50 at 15.

¹²³ *Ibid.*

aquatic species),¹²⁴ and orders have been made only for one aquatic species comprising two populations.¹²⁵ As has been pointed out elsewhere, this order was probably more the consequence of “legal action taken by the environmental community” than the federal government pro-activity.¹²⁶

Most statements and orders have been issued by DFO,¹²⁷ likely because aquatic species are protected by SARA wherever they occur, while most terrestrial species are only protected in federal lands and require a “safety net” order to protect provincial land or land in a territory. The approach of DFO, in the limited implementation of s. 58, has been to consider that critical habitat is legally protected by the fish habitat protection provisions of the *Fisheries Act*, particularly s. 35, in relation to the prohibition to kill, harm, harass, take or capture individuals of species at risk contained in s. 32 of SARA. Other specific regulations and codes of practice have been cited in addition, on a species-specific basis. As a consequence, Fisheries and Oceans has mostly concluded that a critical habitat protection order triggering the s. 58 prohibitions is not necessary.

This interpretation of s. 58 has been recently reviewed and rejected by the Federal Court in *David Suzuki Foundation v. Canada (Minister of Fisheries and Oceans and Minister of the Environment)* (Killer whale case).¹²⁸ The judgment reaffirms an ecosystem notion of critical habitat that includes geophysical, biological, chemical and acoustic attributes of critical habitat.¹²⁹ As a consequence, all of these attributes need to be legally protected.¹³⁰ It further adds that “Ministerial discretion does not legally protect critical habitat within the meaning of s. 58 of SARA, and it was unlawful for the Minister to have cited discretionary provisions of the *Fisheries Act* in the Protection Statement.”¹³¹ It also concludes that it is unlawful for the Minister to cite provincial regulations, prospective laws and regulations, and voluntary measures.¹³²

¹²⁴ Engelmann’s Quillwort Critical Habitat in the Trent-Severn Waterway National Historic Site of Canada, Pink Sand-verbena Critical Habitat in Pacific Rim National Park Reserve of Canada, Northern Bottlenose Whale (Scotian Shelf Population), Nooksack Dace, and North Atlantic Right whale (see online: SARA Public Registry <http://www.sararegistry.gc.ca/default_e.cfm>).

¹²⁵ Northeast Pacific Northern and Southern Resident Populations of Killer whale (*Orcinus orca*) populations (see online: SARA Public Registry <http://www.sararegistry.gc.ca/default_e.cfm>).

¹²⁶ David Suzuki Foundation *et al.*, *supra* note 83.

¹²⁷ From the seven critical habitat statements issued so far, five have been issued by DFO and two by Park Canada. The five statements of DFO include two archived statements. Thus, currently, three aquatic species and two terrestrial species have critical habitat statements. The only critical habitat order was issued by DFO.

¹²⁸ *David Suzuki Foundation v. Canada (Minister of Fisheries and Oceans and Minister of the Environment)*, [2010] F.C.J. No. 1471, 2010 FC 1233.

¹²⁹ *Ibid.*, para. 222 at 47. See also *Environmental Defence Canada v. Canada (Minister of Fisheries and Oceans)*, [2009] F.C.J. No. 1052, 2009 FC 878.

¹³⁰ *Ibid.* at 71.

¹³¹ *Ibid.*

¹³² *Ibid.*

The judgment has been appealed by DFO.¹³³ At the moment, the meaning of “legal protection” for critical habitat protection is entangled in a judicial review.

If the interpretation of the judgment is upheld, there are other aspects of s. 58 that will require further interpretation and guidance. The concept of destruction of critical habitat, particularly as applied to the different attributes of critical habitat, needs to be clarified. Further analysis will be required to determine the implementation of s. 58 prohibitions and its enforcement in situations where destruction of critical habitat results from cumulative impacts, activities taking place outside the critical habitat area, or in cases where the activity and the destruction of habitat have remote or indirect causal relationships.

B. Enhancing Fish Habitat Protection under the *Fisheries Act*

The current uncertainty surrounding the statutory interpretation of s. 58 has had a clear impact on the protection of iBoF salmon critical habitat. To date, the Minister has not issued either a critical habitat protection statement or a critical habitat protection order for iBoF Atlantic salmon. In the absence of an order triggering s. 58 prohibitions, iBoF Atlantic salmon critical freshwater habitat is protected through the provisions of the *Fisheries Act*, which the Federal Court has deemed not equivalent to the “legal protection” required in SARA.¹³⁴ Section 35 of the *Fisheries Act* prohibits any person to carry on any work or undertaking that results in the harmful alteration, disruption or destruction (HADD) of fish habitat, unless an authorization of the Minister is obtained or the work or undertaking is carried out under regulations made by the Governor in Council under the *Fisheries Act*.

The Recovery Strategy asserts that all habitat in iBoF is protected under the *Fisheries Act* and will continue to be protected by both the *Fisheries Act* and SARA.¹³⁵ Although the Recovery Strategy does not specify how this protection would take place, Fisheries and Oceans has developed policy guidelines to implement the fish habitat protection provisions under the *Fisheries Act*, including the implementation of these policies in cases where fish habitat protection is required for protecting species at risk.

To guide the implementation of the *Fisheries Act* habitat provisions, and particularly s. 35, Fisheries and Oceans developed the overarching 1986 Policy for the Management of Fish Habitat, which introduced the “no net loss” policy as a guiding principle to fish habitat management decisions. Proposed works and undertakings are assessed through a risk management framework to determine if the activity constitutes a HADD of fish habitat. This assessment can conclude that a) the activity, as proposed or with modifications recommended by DFO, does not cause a HADD and does not require an authorization, which is informed to the proponent through a Letter of Advice; b) the activity does cause an unacceptable HADD to fish habitat, in which case the authorization is denied; or c) the activity does cause

¹³³ See Federal Court, Court Index and Docket, Court Number T-1552-08, online: Federal Court <<http://cas-nrc-nter03.cas-satj.gc.ca/ftcf/index.html>>.

¹³⁴ *David Suzuki Foundation v. Canada (Minister of Fisheries and Oceans and Minister of the Environment)*, *supra* note 128.

¹³⁵ Recovery Strategy, *supra* note 1 at 41.

an acceptable HADD to fish habitat, in which case a HADD authorization can be issued after an environmental assessment according to the *Canadian Environmental Assessment Act*.¹³⁶

After the entry into force of SARA, guidelines were developed to incorporate specific considerations of HADD to the habitat of SARA-listed species in the risk management framework.¹³⁷ In cases where a HADD that affects a species at risk is allowed, the HADD authorization would require compliance with s. 73 substantive and procedural conditions. This authorization, known as SARA-complaint HADD authorization, also serves as SARA incidental harm authorization according to s.74.

This approach to habitat protection for species at risk faces several limitations. A first limitation is that, despite the efforts to provide specific guidelines for the consideration of the particular circumstances of species at risk and the legal obligations under SARA within the risk management framework, there is still ample room for discretion in the authorization process that renders the protection of critical habitat uncertain. Fisheries and Oceans has not developed particular and specific guidance on some key issues in the implementation of the risk management framework, including the assessment of residual effects, the sensitivity of the SARA-species and critical habitat, or the possibility of compensating for the loss of critical habitat.

The legality of the procedure for issuing HADD authorizations is a further matter of controversy. The possibility of issuing letters of advice informing a proponent that a work and undertaking has likely no impact on fish habitat, either as proposed or with some additional mitigation measures, has been criticized not as discretionary but as bluntly illegal for breaching other pieces of legislation.¹³⁸ This

¹³⁶ Fisheries and Oceans Canada, *Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff*, version 1.0, at 8, online: DFO <<http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/index-eng.htm>>. The Risk Management Framework considers the possibility of issuing streamlined authorization process for medium risk activities (i.e. small-scale or temporary HADD) (*ibid.* at 8 and 21). However, there are only a limited number of streamlined processes established (Fisheries and Oceans Canada, *Practitioners Guide to Writing Letters Used in Fisheries Act and Species at Risk Act Reviews for Habitat Management Staff*, version 2.0, 2007, at 4, online: DFO <<http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/index-eng.htm>>). Where there is no streamlined authorization process, a site-specific authorization must be issued (*ibid.*). It is also worth mentioning that, in the case a HADD permit is issued under s. 35, the authorization can include mitigation measures, compensation, monitoring and financial securities commensurate with the level of impact associated with the project.

¹³⁷ See: Fisheries and Oceans Canada, *Practitioners Guide to the Species at Risk Act (SARA) for Habitat Management Staff*, *supra* note 117; Fisheries and Oceans Canada, *Practitioners Guide to Writing an Authorization for the Habitat Protection Provisions of the Fisheries Act*, version 2.0, September 2010, online: DFO <<http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/index-eng.htm>>; and Fisheries and Oceans Canada, *Practitioners Guide to Writing Letters Used in Fisheries Act and Species at Risk Act Reviews for Habitat Management Staff*, *ibid.*

¹³⁸ Arlene Kwasiak, "Slow on the Trigger: The Department of Fisheries and Oceans, the *Fisheries Act* and the *Canadian Environmental Assessment Act*" (2004) 27 Dal. L.J. 347.

potential illegality has been, however, challenged and dismissed in one judicial review.¹³⁹

A further challenge lies in the effectiveness of the fish habitat protection provisions of the *Fisheries Act* and the implementation guidelines. The fish habitat policy and its implementation have been recently subject to review by the Commissioner of the Environment and Sustainable Development¹⁴⁰ and the conclusions shed more than a doubt on the actual protection to fish habitat resulting from the application of these policy documents. Among other problems, the Commissioner noted a lack of consistency and predictability in the implementation of the policy documents, lack of detailed national guidance to help staff to make decisions, little monitoring of compliance and evaluation of the effectiveness of the decisions, and deficient enforcement efforts. As a result, DFO “still cannot determine the extent to which it is progressing toward the Policy’s long-term objective of a net gain in fish habitat.”¹⁴¹ This assessment, serious as it may be in the case of fish habitat in general, is especially worrisome for critical habitat of aquatic species in imminent risk of extinction.

Another limitation of using s. 35 of the *Fisheries Act* to protect critical habitat is the limited scope of coverage. Section 35 applies in cases of work and undertakings, but not to other activities that may impact the habitat and the species at risk that depend on it.

A final limitation relates to the actual implementation of fish habitat protection provisions under the *Fisheries Act* to projects potentially affecting iBoF Atlantic salmon. An analysis of the SARA s. 73 permits and s. 74 authorizations issued for iBoF Atlantic salmon included in the SARA Public Registry shows that Fisheries and Oceans has not issued s. 74 authorizations. This only allows concluding that, in DFO’s expert judgment, none of the works and undertakings reviewed since June 2004 in any of the 50 listed iBoF Atlantic salmon rivers have been considered to have a HADD that affected Atlantic salmon and that would require a SARA-compliant HADD authorization.

(vi) *Getting a Grip on Future Atlantic Salmon Listing and Protection*

There is still a potential challenge on the horizon, resulting from the recent assessment and potential listing of nine other Atlantic salmon designatable units as endangered, threatened, or special concern by COSEWIC in November 2010. If listed, DFO will need to determine how to address the conservation and recovery of distinctive conservation units that share, nevertheless, biological characteristics, habitat requirements, and potential threats.

Although the newly assessed populations will likely benefit from the experience and background work that has already been developed for Atlantic salmon,

¹³⁹ *Cassiar Watch v. Canada (Minister of Fisheries and Oceans)*, [2010] F.C.J. No. 282, 2010 FC 152.

¹⁴⁰ Commissioner of the Environment and Sustainable Development, *Report of the Commissioner of the Environment and Sustainable Development — Spring 2009, Chapter 1: Protecting Fish Habitat*, online: <http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200905_e_32544.html>.

¹⁴¹ *Ibid.* at 12.

there is also the risk that the recovery process of iBoF Atlantic salmon being detained or slowed down in order to address the recovery of this unit jointly or at least coordinately with one or more of the other Atlantic salmon populations at risk. Relevant questions relate, for example, with the number, role, composition and interactions of recovery teams or other advisory bodies; with the adoption of separate recovery strategies or the adaptation of the existing one for new populations; and with the feasibility and desirability of adopting joint or separate action plans. It will be a challenge to balance the need to approach the issues affecting all Atlantic salmon populations through coherent and comprehensive strategies, plans, research and actions; and the need to act as soon as possible to recover iBoF Atlantic salmon.

(vii) Integrating the Recovery Strategy to Broader Policy and Conservation Efforts

A further aspect where the Strategy shows striking limitation is in its lack of explicit relationship with policy and conservation efforts directly related to the protection of Atlantic salmon. This weakness speaks of an apparent lack of integration and coordination in the federal government response to conservation of wildlife, which may represent important challenges in the conservation and management responses for iBoF Atlantic salmon.

The iBoF Salmon Recovery Strategy does not make any reference to *Canada's Policy for Conservation of Wild Atlantic Salmon*.¹⁴² This document was developed at the same time as the iBoF Atlantic salmon Recovery Strategy, and its final version was adopted only one year earlier in August 2009.¹⁴³ Being the explicit intention of the Policy to serve as a governing framework for the implementation of statutory authorities for conservation of Atlantic salmon,¹⁴⁴ it is simply striking that the Strategy does not acknowledge the framework set out in the Policy.

Further, the Strategy does not make any reference to international protection and conservation efforts for Atlantic salmon. The possible need to strengthen cooperation with the United States regarding research, data collection and sharing, and management for common or transboundary threats to Atlantic salmon was not con-

¹⁴² Fisheries and Oceans Canada, *Canada's Policy for Conservation of Wild Atlantic Salmon* (August, 2009), online: Fisheries and Oceans <<http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/wasp-pss/index-eng.htm>>. This document was adopted in August 2009 and constitutes an overarching policy framework to achieve the goal of maintaining and restoring healthy and diverse salmon populations (including iBoF salmon) and their habitat, for the benefit and enjoyment of the people of Canada in perpetuity.

¹⁴³ *Ibid.* The preparation of a Policy for the Conservation of Atlantic Salmon was announced in December 2004 and the work started in 2005 (Fisheries and Oceans Maritimes Region online: <<http://www2.mar.dfo-mpo.gc.ca/science/diad/wasp/e/intro-e.html>>).

¹⁴⁴ Its objective is to “represents Canada’s commitment and planned course of action for the conservation of wild Atlantic salmon. (. . .) It neither amends nor overrides existing legislation or regulations but will govern how these statutory authorities will be implemented” (*ibid.*).

sidered. Conservation efforts by the North Atlantic Salmon Conservation Organization were mentioned,¹⁴⁵ but their potential contribution for iBoF Atlantic salmon protection were not further explored nor explicitly considered as a specific strategic approach.¹⁴⁶

(b) Strengthening Protective Nets Outside SARA

SARA cannot “swim alone” in the protection and recovery of species at risk. Numerous federal and provincial laws and regulations may also contribute to species at risk protection, especially when their implementation is in line with the recovery planning process and the protective tools under SARA. Particularly relevant for Atlantic salmon is the need to: bolster environmental impact assessment; enhance provincial engagement; ensure full implementation of Canada’s *Oceans Act*; and chart future directions for the North Atlantic Salmon Conservation Organization (NASCO). The need to strengthen Canadian aquaculture law and policy framework is not discussed in this article as it has been extensively analyzed elsewhere.¹⁴⁷

(i) Bolstering Environmental Impact Assessment

While examples of effective environmental impact assessment (EIA) application to species at risk threats may be found,¹⁴⁸ the rather weak EIA enhancements provided by, and pursuant to, SARA raise the ongoing need to consider ways to further strengthen environmental assessment review in the species at risk context.¹⁴⁹ Key areas that warrant further consideration are: the lack of a SARA-trigger for federal environmental assessment; the need for more comprehensive assessments; the apparent lack of consistency in the implementation of SARA requirements for environmental assessments; and the lack of clear guidance on the application of the precautionary approach.

SARA does not trigger a federal environmental assessment in cases where

¹⁴⁵ Recovery Strategy, *supra* note 1 at 12.

¹⁴⁶ See *infra* note 190 and accompanying text.

¹⁴⁷ David L. VanderZwaag & Gloria Chao, eds., *Aquaculture law and policy: towards principled access and operations* (London; New York: Routledge, 2006).

¹⁴⁸ For example, the joint federal-provincial environmental assessment review panel for the Whites Point Quarry development proposal in Nova Scotia applied a strong precautionary approach and in part because of the scientific uncertainty regarding potential impacts on endangered Atlantic salmon, recommended against project approval. The advice was subsequently followed by both federal and provincial governments. See: David L. VanderZwaag & Jason May, “Quarrels over a Proposed Quarry in Nova Scotia: Successful Application of Sustainability Principle in Environmental Impact Assessment but Not a Perfect Ending” in Klaus Bosselmann, Ron Engel & Prue Taylor, eds., *Governance for Sustainability: Issues, Challenges, Successes* (Gland, Switzerland: IUCN; Bonn: in collaboration with the IUCN Environmental Law Centre, 2008) 111.

¹⁴⁹ A comprehensive critique of the *Canadian Environmental Assessment Act* is beyond the scope of this paper. For a critical review of the Act, see Meinhard Doelle, *The Federal Environmental Assessment Process: A Guide and Critique* (Markham, Ont.: LexisNexis Canada, 2008).

species at risk may be affected. The Act only requires the consideration of adverse environmental effects on species at risk within the existing, and limited, scope of federal environmental assessments.¹⁵⁰

If the environmental assessment of a work or undertaking is triggered, the potential adverse effects to species at risk do not influence the type of assessment being undertaken. In a vast majority of cases, the assessment will be limited to an environmental screening,¹⁵¹ which has been subject to serious scrutiny regarding their effectiveness and efficacy.¹⁵² A comprehensive study takes place only for the limited works and undertakings included in the *Comprehensive Study List Regulations*.¹⁵³ The Minister of Environment has rarely used the option of referring a project with significant adverse environmental effects or that warrants public concern to a review panel. The option of referring such a project to a mediator has not been used.¹⁵⁴

When a federal environmental assessment is conducted, the Responsible Authority must ensure that the requirements of s. 79 of SARA are met. Although a comprehensive analysis of the extent to which this requirement has been fulfilled is beyond the scope of this study, the review of a sample of environmental screening reports for finfish aquaculture projects within the Bay of Fundy¹⁵⁵ raises concerns

¹⁵⁰ In contrast, the New Brunswick *Environmental Impact Assessment Regulation* under the *Clean Environment Act* includes, as undertakings that requires an environmental assessment, all enterprises, activities, projects, structures, works or programs affecting any unique, rare or endangered feature of the environment (New Brunswick Regulation 87-83, *Environmental Impact Assessment Regulation*, O.C. 87-558, (*Clean Environment Act*), Schedule A paragraph u).

¹⁵¹ According to a 2009 Report by the Commissioner of the Environment and Sustainable Development, 99 per cent of the environmental assessments are undertaken as screenings, while, on average, eight comprehensive studies and five panels have taken place annually (Commissioner of the Environment and Sustainable Development, Report of the Commissioner of the Environment and Sustainable Development to the House of Commons, Fall 2009, Chapter 1, Applying the *Canadian Environmental Assessment Act*, online: Office of the Auditor General, Environment and Sustainable Development <http://www.oag-bvg.gc.ca/internet/English/esd_fs_e_46.html>).

¹⁵² *Ibid.* at 19-20.

¹⁵³ SOR/94-638.

¹⁵⁴ CEAA, ss. 25–28; Commissioner of the Environment and Sustainable Development, *supra* note 151.

¹⁵⁵ Five Environmental Assessment (Screening) Reports were reviewed: Proposed Aquaculture Sites for the Culture of Atlantic salmon near Long Island in St. Mary's Bay, Nova Scotia, Canadian Environmental Assessment Register (CEAR) reference number 10-01-55946; Bliss Harbour Aquaculture Lease MF-0029 and MF-0032 Kelly Cove Aquaculture Ltd., CEAR Ref. Nr. 10-01-54205; Finfish Aquaculture Site MF-0027 (Consolidation of MF-0027 and MF-0025), Bliss Harbour, NB, CEAR Ref. Nr. 10-01-53859; Expansion of an Aquaculture Operation in Campobello, New Brunswick, CEAR Ref. Nr. 09-01-47806; and Duck Cove, Aquaculture Site for Rearing Finfish (Atlantic salmon), CEAR Ref. Nr. 03-01-166.

over the consistency of the practices and decisions made.¹⁵⁶ A clear example thereof are the different approaches adopted to determine whether iBoF salmon is likely to be affected by a project, an aspect that SARA has left to a judgment call by the Responsible Authority.¹⁵⁷ In some of the reviewed cases, Atlantic salmon was not identified as a species to be included in the assessment because, according to the Atlantic Canada Conservation Data Center (ACCDC), it was not present in the project area or within a five kilometers buffer zone.¹⁵⁸ In two cases, the ACCDC was not the only source of information used to assess the potential presence of the species in the area.¹⁵⁹ In one of these cases, however, the regulatory authority considered that, despite its potential presence in the area, this endangered species was not a valuable ecosystem component potentially impacted by the project.¹⁶⁰ This decision was made on the basis that the proposed project area did not provide critical or limiting habitat for the species, an analysis that disregarded other impacts of the project on wild endangered populations. Only in one of the reviewed cases was endangered Atlantic salmon identified as a valuable ecosystem component, and the impacts of the project on these populations particularly considered in the assessment.¹⁶¹

A further concern is the fact that existing legislative provisions and policy guidelines do not consistently and clearly address the implementation of the precautionary approach, a matter of particular importance for Atlantic salmon considering the uncertainties surrounding the low marine survival and the main threats to recovery. Both SARA and CEAA consider the precautionary approach as a guiding principle for their implementation, but they consider different standards for the measures required. While CEAA considers a stronger version of precaution in the

¹⁵⁶ SARA, ss. 79(1) and (2) require the responsible authority to: a) notify the competent Minister if the project is likely to affect a listed wildlife species or its critical habitat; b) identify the adverse effects of the project on the listed wildlife species and its critical habitat; c) ensure that measures are taken to avoid or lessen those effects; and d) monitor those effects.

¹⁵⁷ VanderZwaag & Hutchings, *supra* note 25 at 236.

¹⁵⁸ See: Bliss Harbour Aquaculture Lease, CEAR 10-01-54205; Campobello Aquaculture Operation, CEAR 09-01-47806, and Duck Cove Aquaculture Site, CEAR 03-01-166. According to the screening reports, the five kilometers buffer zone is a standard practice of the Atlantic Canada Conservation Data Center (ACCDC), the database used for this purposes. A five kilometers buffer zone has also explicitly been included in several guidelines for environmental assessment of marine finfish aquaculture projects, including: L.I. Doucette and B. Hargrave, *A Guide to the Decision Support System for Environmental Assessment of Marine Finfish Aquaculture*, Can. Tech. Rep. Fish. Aquat. Sci. 2426 (Dartmouth, NS: Fisheries and Oceans, 2002); and Fisheries and Oceans Canada, *Interim Guide to Information Requirements for Environmental Assessment of Marine Finfish Aquaculture Projects* (February 15, 2002). See also B.T. Hargrave, “A traffic light decision system for marine finfish aquaculture siting” (2002) 45 *Ocean & Coastal Management* 215.

¹⁵⁹ See Aquaculture Site St. Mary’s Bay, CEAR 10-01-55946; and Aquaculture Site Bliss Harbour, CEAR 10-01-53859.

¹⁶⁰ See Aquaculture Site Bliss Harbour, CEAR 10-01-53859.

¹⁶¹ See Aquaculture Site St. Mary’s Bay, CEAR 10-01-55946.

purpose section of the Act that may lead even to prohibition of certain activities by the federal government,¹⁶² SARA considers a weaker version that rests on cost-effective measures to prevent the reduction or loss of species even when there is lack of full scientific certainty.¹⁶³ Section 79, in turn, does not prohibit any adverse effect on species at risk but just seeks to identify, avoid or lessen them, at the discretion of the regulatory authority.

The SARA-CEAA policy document, *Addressing Species at Risk Act Considerations under the Canadian Environmental Assessment Act: A federal policy and procedures guide*, reiterates the need to adopt a precautionary approach in cases of uncertainty in the analysis.¹⁶⁴ This document does not specify what is required under a precautionary approach, but makes a reference to a further policy document, *Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada*.¹⁶⁵ Guideline 10 of the Best Practice Guide requires applying “the precautionary approach/principle when making decisions concerning significance of effects on wildlife species at risk,”¹⁶⁶ specifying what the application of the precautionary approach entails and including an explicit reverse onus of proof.¹⁶⁷ This strong version of precautionary approach as applied to wildlife at risk is consistent with international guidelines.¹⁶⁸ However, these policies have been developed by the

¹⁶² CEEA, ss. 4(1)(a) and 4(2).

¹⁶³ SARA, preamble para. 5 and s. 38.

¹⁶⁴ SARA-CEAA Guidance Working Group, *Addressing Species at Risk Act Considerations under the Canadian Environmental Assessment Act: A federal policy and procedures guide* (Final Draft, August 2005), at 35, online: Canadian Environmental Network <<http://www.cen-rce.org/eng/caucuses/assessment/index.html>>.

¹⁶⁵ Canadian Wildlife Service and Environment Canada, *Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada*, 1st ed., February 2004, online: Environment Canada <<http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=5407909E-10F6-4AFE-ACDF-75B9E820B4A1>>.

¹⁶⁶ *Ibid.* at 24–26.

¹⁶⁷ The best practices, in this subject, state that: “The onus of proof should be on the proponent to demonstrate to the satisfaction of the decision-maker that adverse effects on wildlife at risk or biological diversity are not significant” (*ibid.* at 25).

¹⁶⁸ IUCN, *Guidelines for Applying the Precautionary Principle to Biodiversity Conservation and Natural Resource Management*, approved by the 67th meeting of the IUCN Council, 14–16 May 2007, online: IUCN <http://cmsdata.iucn.org/downloads/ln250507_ppguidelines.pdf>. See, in particular, Guideline 8 (Allocate roles and responsibilities for providing information and evidence of potential threat and/or safety according to who is proposing a potentially harmful activity, who benefits from it and who has access to information and resources), and Guideline 12, on Adaptive Management, which states that applying the precautionary principle may sometimes require strict prohibition of activities, which is particular pertinent in situations where particular vulnerable species or ecosystem are concerned. NASCO, in turn, also considers a strong version of burden of proof in particular with respect to aquaculture activities that may have significant adverse impact on wild salmon stocks (NASCO, *Resolution by the Parties to the Convention for the Conservation of Salmon in the North Atlantic Ocean to Minimize Impacts from Aquaculture*,

Minister responsible for Environment Canada and Parks Canada, while DFO has not developed equivalent guidelines.

Various options exist for bolstering federal environmental assessment law and policy. Key options include amending CEAA to require assessment of projects which may significantly impact aquatic species at risk,¹⁶⁹ and amending the *Comprehensive Study List Regulations* to mandate a higher level of scrutiny for such projects. On the policy side, an explicit cross-reference in the iBoF Salmon Strategy to the precautionary approach included in the *Policy for the Conservation of Wild Atlantic Salmon* could be made.¹⁷⁰ This Policy states that the implementation of its objectives “must and will be” consistent with the precautionary approach and provides guidance for its implementation, including a reversal of the burden of proof. Further, specific and comprehensive guidance for the assessment of projects in the Bay of Fundy could be developed. This recommendation was considered among the measures directed to mitigate threats to iBoF salmon in the Recovery Potential Assessment,¹⁷¹ but the Strategy remained silent on this matter.

(ii) *Enhancing Provincial Engagement in Aquatic Endangered Species Protection*

Provinces exercise legislative jurisdiction over a series of topic areas that directly or indirectly affect aquatic species, many of which have been included as threats for iBoF Atlantic salmon. They include: land use, riparian rights associated with water quantity and water quality, forest management, mining, aquaculture development, agriculture, and highway and infrastructure development.¹⁷² For this reason, the participation of the two provinces within the range of distribution of iBoF Atlantic salmon, New Brunswick and Nova Scotia, is necessary for the effective implementation of measures to protect and recover the species at risk. The Recovery Strategy recognizes the importance of the commitment and cooperation

Introductions and Transfers, and Transgenic in the Wild Salmon Stocks (the Williamsburg Resolution), CNL(06)48 (adopted 2003 and amended in 2004 and 2006), online: NASCO <<http://www.nasco.int/pdf/agreements/williamsburg.pdf>>), and for the projects having an impact on salmon habitat (NASCO, *Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat*, CNL(01)51, online: NASCO <<http://www.nasco.int/pdf/agreements/habitatplan.pdf>>). However, the strength of these NASCO documents is low, as discussed further below.

169 For a related suggestion, namely to amend CEAA to require federal environmental assessment of projects likely to significantly impact designated federal environmental priorities, particularly climate change, see Stephen Hazell, “Improving the Effectiveness of Environmental Assessment in Addressing Federal Environmental Priorities” (2010) 24 J.E.L.P. 213.

170 *Supra* note 142.

171 This document recommends to “enhance and formalize the risk-based management approach for review of development proposals in and around iBoF habitat pursuant to the habitat Provisions of the *Fisheries Act*, SARA and the *Canadian Environmental Assessment Act*” (Recovery Potential Assessment, *supra* note 15 at 23).

172 Recovery Strategy, *supra* note 1 at 11.

of different constituencies, including provincial governments.¹⁷³ However, it seems that the potential for meaningful cooperation and complementary action towards iBoF Atlantic salmon conservation and recovery is not being fully realized.

A first element of concern is the limited representation of provincial governments in the iBoF Atlantic salmon recovery team. Between 2005 and 2010, only seven representatives of the provincial governments attended the Recovery Team meetings. Never were there more than two representatives at the same time, while in one meeting none was present.¹⁷⁴ In contrast, no less than 15 and up to 22 Fisheries and Oceans staff members were present at any given Recovery Team meeting. The Recovery Team has had a marked preeminence of federal government, and particularly Fisheries and Oceans, representatives.

A second concern is that the Strategy does not highlight the role of provincial governments in addressing specific threats to iBoF Atlantic salmon, which likely is a consequence of the lack of specific management approaches in the Strategy, as analyzed previously. The roles of the provinces are not delineated, and only a general reference to the involvement of “government,” along with non-governmental and conservation organizations, other stakeholders and the general public, is included as an approach of the fifth, and less important, recovery objective of communicating and increasing the general awareness of the status and recovery of iBoF salmon.¹⁷⁵

Perhaps provincial roles might be further clarified at the action planning stage. Issues to be considered include the adequacy of existing provincial coastal management planning frameworks¹⁷⁶ and whether iBoF salmon should be listed under the provincial endangered species legislation.

(iii) *Ensuring Full Implementation of Canada’s Ocean Act*

Canada’s *Ocean’s Act*,¹⁷⁷ passed in 1996 and entering into force on 31 January 1997, holds potentials to help protect wild Atlantic salmon. The Act requires the Minister of Fisheries and Oceans to lead the development and implementation of integrated management plans for Canada’s coastal and marine waters¹⁷⁸ and management plans could eventually assist salmon in various ways, for example, placing protection of SARA-listed populations as a high planning priority and helping to identify critical marine habitats.¹⁷⁹ The Act also requires the Minister of Fisheries and Oceans to lead the development and implementation of a national

¹⁷³ *Ibid.* at v.

¹⁷⁴ Attendance to meetings varied between 29 and 36 persons.

¹⁷⁵ Recovery Strategy, *supra* note 1 at 34. The five objectives included in the Strategy are prioritized (*ibid.* at 32).

¹⁷⁶ See, for example, *Joint Review Panel Report on the Proposed Whites Point Quarry and Marine Terminal Project* (October 2007), Recommendation 2 at 103-104, online: Canadian Environmental Assessment Agency <www.ceaa-acee.gc.ca>.

¹⁷⁷ *Supra* note 21.

¹⁷⁸ *Ibid.*, s. 31.

¹⁷⁹ The Eastern Scotian Shelf Integrated Ocean Management Plan, while not specifically addressing at risk Atlantic salmon, explicitly notes the importance of protecting species at risk through management planning and the potential for identifying critical habitats.

system of marine protected areas.¹⁸⁰ One of the main justifications for establishing an MPA pursuant to the *Oceans Act* is to conserve and protect endangered or threatened marine species and their habitats.¹⁸¹

As various publications have emphasized, Canada has been lagging in moving from paper rhetoric to practical implementation.¹⁸² Only eight MPAs have been established to date under the *Oceans Act*,¹⁸³ and of the five in Atlantic Canada, only one is located in the Bay of Fundy region, the Mushquash Estuary MPA in New Brunswick.¹⁸⁴ Integrated management planning has largely focused on five Large Ocean Management Areas (LOMAs)¹⁸⁵ with coastal area planning being exceedingly limited.¹⁸⁶ The Eastern Scotian Shelf Integrated Oceans Management process has chosen to exclude the 12 n.m. territorial sea and the plan has yet to be formally endorsed by the Minister of Fisheries and Oceans.¹⁸⁷ No coastal management areas (CMAs) have been established in the Bay of Fundy Region although an integrated management planning process has been extended to a coastal area in Southwest New Brunswick.¹⁸⁸ In March 2011, Canada and Nova Scotia signed a Memorandum of Understanding which promises to enhance cooperation in integrated coastal and ocean management planning in various regions, including the Bay of Fundy/Gulf of Maine.¹⁸⁹

The Plan is available online: Fisheries and Oceans Maritime Region <<http://www.mar.dfo-mpo.gc.ca/e0010316>>.

180 *Oceans Act*, s. 35(2).

181 *Ibid.*, s. 35(1)(b).

182 See e.g. Sabine Jessen, “A Review of Canada’s Implementation of the *Oceans Act* since 1997 — From Leader to Follower?” (2011) 39 Coastal Mgmt. 20 and Peter J. Ricketz & Lawrence Hildebrand, “Coastal and Ocean Management in Canada: Progress or Paralysis?” (2011) 39 Coastal Mgmt. 4.

183 Designated MPAs include: the Endeavour Hydrothermal Vents and Bowie Seamount in British Columbia; the Gully submarine canyon in Nova Scotia; Basin Head in Prince Edward Island; the Mushquash Estuary in New Brunswick; Eastport in Newfoundland; Gilbert Bay in Labrador; and Tarium Niriyutait in the Arctic. See Fisheries and Oceans Canada, Marine Protected Areas, online: <<http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm>>.

184 *Mushquash Estuary Marine Protected Area Regulations*, SOR/2006-354.

185 The five priority planning areas include: Placentia Bay and the Grand Banks, the Scotian Shelf, the Gulf of St. Lawrence, the Beaufort Sea and the Pacific North Coast. See Fisheries and Oceans Canada, *Canada’s Oceans Action Plan: For Present and Future Generations* (2005) at 13–15.

186 For a review of the limitations and challenges, see: Fisheries and Oceans, *Proceedings of the Federal-Provincial-Territorial Coastal Management Areas Workshop, 16-17 May 2007*, DFO. Can. Sci. Advis. Sec. Proceed. Ser. 2007/025 (Ottawa: Fisheries and Oceans, 2007).

187 See Jensen, *supra* note 182 at 39-40.

188 For publications and initiatives surrounding the Southwest New Brunswick Marine Resources Planning process, see online: <<http://www.bofmr.ca>>.

189 Memorandum of Understanding Between Canada and Nova Scotia Respecting Coastal and Oceans Management in Nova Scotia, March 23, 2011, available online: Government of Nova Scotia <<http://www.gov.ns.ca/coast/consultation-mou.htm>>.

(iv) *Charting Future Directions for the North Atlantic Salmon Conservation Organization (NASCO)*

NASCO, established in 1984 as a regional forum to foster regional cooperation in conserving wild salmon stocks in the North Atlantic Ocean,¹⁹⁰ includes Canada as a Party¹⁹¹ but the effectiveness of NASCO has been limited on numerous fronts.¹⁹² Being highly restricted in its regulatory powers, NASCO has had to rely largely on voluntary guidelines and codes to address the multiple threats facing wild salmon.¹⁹³ Key non-mandatory documents include: Agreement on Adoption of a Precautionary Approach (1998);¹⁹⁴ Action Plan for Application of the Precautionary Approach (1999);¹⁹⁵ the Williamsburg Resolution to Minimize Impacts from Aquaculture, Introductions and Transfers, and Transgenics on the Wild Salmon Stocks (2003, as amended in June 2004 and June 2006);¹⁹⁶ NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat (2001);¹⁹⁷ NASCO Guidelines for the Management of Salmon Fisheries;¹⁹⁸ Guidance on Best Management Practices to Address Impacts of Sea Lice and Escaped Farmed Salmon on Wild Salmon Stocks (2009);¹⁹⁹ and NASCO Guidelines for the Protection, Restoration and Enhance-

¹⁹⁰ Pursuant to the *Convention for the Conservation of Salmon in the North Atlantic Ocean*, 2 March 1982, 1338 UNTS 33, C.T.S. 1983/11.

¹⁹¹ Parties include, besides Canada, Denmark (in respect of Greenland and the Faroe Islands), the European Union, Norway, the Russian Federation and the United States of America. “About NASCO”, online NASCO <<http://www.nasco.int/about.html>> (accessed 16 February 2011).

¹⁹² For recent critique, see David L. VanderZwaag & Emily J. Pudden, “The North Atlantic Salmon Conservation Organization (NASCO): Surpassing a 25 Year Voyage in Transboundary Cooperation but Still Confronting a Sea of Challenges” in Dawn A. Russell & David L. VanderZwaag, eds., *Recasting Transboundary Fisheries Management Arrangements in Light of Sustainability Principles: Canadian and International Perspectives* (Leiden: Martinus Nijhoff, 2010) 307.

¹⁹³ Regulatory constraints include a requirement for unanimous agreement among voting members of regional commissions (North American, North-East Atlantic and West Greenland) before regulatory measures can be imposed and the option for parties to opt out of proposed regulatory measures. See *ibid.* at 310-11.

¹⁹⁴ NASCO, *Agreement on Adoption of a Precautionary Approach*, CNL(98)46, online: NASCO <http://www.nasco.int/pa_agreement.html>.

¹⁹⁵ NASCO, *Action Plan for the Application of the Precautionary Approach*, CNL(99)48, Annex 11 of NASCO, *Report of the Sixteenth Annual Meeting of the Council* (1999).

¹⁹⁶ NASCO, CNL(06)48, *supra* note 168.

¹⁹⁷ NASCO, CNL(01)51, *supra* note 168.

¹⁹⁸ NASCO, *Guidelines for the Management of Salmon Fisheries*, CNL(09)43, online: NASCO <<http://www.nasco.int/fisheries.html>>.

¹⁹⁹ NASCO, *Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks*, SLG(09)5, (adopted in June 2009 and revised in June 2010), online: NASCO <<http://www.nasco.int/pdf/aquaculture/BMP%20Guidance.pdf>>.

ment of Atlantic Salmon Habitat (2010).²⁰⁰ The Williamsburg Resolution contains various guidance documents as annexes including Guidelines on Containment of Farm Salmon,²⁰¹ Guidelines for Stocking Atlantic Salmon,²⁰² and Guidelines for Action on Transgenic Salmonids.²⁰³

In an attempt to facilitate transparency and accountability in how NASCO parties are faring in implementing their numerous conservation commitments, NASCO has required parties to develop overall implementation plans²⁰⁴ and to prepare annual reports on one of the three focus areas set out in the implementation plans. Focus Area Reports (FARs) on fisheries management were submitted by parties in 2008, salmon habitat reports in 2009, and aquaculture and associated activities reports in 2010.²⁰⁵ The FARs have been subject to critical analysis by Review Groups involving both governmental and NGO representation.²⁰⁶

While useful, the focus area reporting process has been criticized regarding the high level of generality in many reports and the lack clarity in implementation actions. For example, the final report of the Ad Hoc Review Group on Protection, Restoration and Enhancement of Salmon Habitat lamented over how most FARs failed to address in any detail on how biological factors, such as invasive species, poor water quality, aquaculture-related diseases and parasites, might affect the productive capacity of salmon and highlighted how many FARs, including Canada's, failed to clarify how the burden of proof is placed on proponents of activities having potential to impact salmon habitat.²⁰⁷ The draft report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group noted that few FARs give information on international cooperation initiatives urged by the Williamsburg Resolution to minimize aquaculture impacts on wild stocks. The Review Group further concluded that no jurisdiction was able to show attainment of international goals, specifically 100 per cent containment of farmed salmon and 100 per cent of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms.²⁰⁸

²⁰⁰ NASCO, *Guidelines for the Protection, Restoration and Enhancement of Atlantic Salmon Habitat*, CNL(10)51, online: NASCO <<http://www.nasco.int/habitat.html>>.

²⁰¹ NASCO, *supra* note 168, Annex 3.

²⁰² *Ibid.*, Annex 4.

²⁰³ *Ibid.*, Annex 5.

²⁰⁴ A Review Group issued a final report on the submitted implementation plans at the 2008 annual meeting of NASCO. See NASCO, *Report of the Ad Hoc Review Group on Implementation Plans*, CNL(08)10, online: NASCO <<http://www.nasco.int/nextsteps.html>>.

²⁰⁵ VanderZwaag & Pudden, *supra* note 192 at 330.

²⁰⁶ *Ibid.* at 330-31.

²⁰⁷ NASCO, *Final Report of the Habitat Protection, Restoration and Enhancement Focus Area Review Group*, CNL(10)11, online: NASCO <[http://www.nasco.int/pdf/far_habitat/cnl\(10\)11.pdf](http://www.nasco.int/pdf/far_habitat/cnl(10)11.pdf)>.

²⁰⁸ NASCO, *Draft Report of the Aquaculture, Introductions and Transfers and Transgenics Focus Area Review Group*, CNL(10)12, online: NASCO <[http://www.nasco.int/pdf/far_aquaculture/cnl\(10\)12.pdf](http://www.nasco.int/pdf/far_aquaculture/cnl(10)12.pdf)>.

Perhaps one of the greatest NASCO challenges has been to ensure precautionary regulatory measures for the taking of North American salmon in other jurisdictions.²⁰⁹ While NASCO has restricted salmon fishing off West Greenland to an internal-use only catch,²¹⁰ harvests have still been quite substantial with 26 tonnes reportedly taken in 2009 in addition to an estimated 10 tonne unreported catch.²¹¹ NASCO has not been able to convince France to become a party on behalf of St. Pierre and Miquelon²¹² and thus the salmon fishery there continues beyond NASCO's regulatory purview.²¹³

NASCO continues to struggle with limited scientific information and understanding. While a major research program, Salmon at Sea (SALSEA), was initiated in 2004 to study the migration and distribution of salmon at sea, the reasons for high marine mortality of salmon remain uncertain.²¹⁴ Climate change impacts on wild salmon are still not well understood.²¹⁵ Little scientific information exists regarding how renewable energy technologies, such as tidal, wave and wind projects,

²⁰⁹ While various studies indicate iBoF salmon have a localized migration, largely staying in the Bay of Fundy and Gulf of Maine, outer BoF salmon have been found to have a wider migration extending to West Greenland but considerable uncertainties still exist in migratory behaviors. See: Recovery Strategy, *supra* note 1 at 5, 14; Amiro, *supra* note 14; and Gilles L. Lacroix & Derek Know, "Distribution of Atlantic Salmon (*Salmo salar*) postsmolts of different origins in the Bay of Fundy and Gulf of Maine and evaluation of factors affecting migration, growth, and survival" (2005) 62 Can. J. Fish. Aquat. Sci. 1363.

²¹⁰ Regulatory measures for West Greenland restrict harvesting to the amount used for internal consumption in Greenland, estimated to be 20 tonnes annually. See NASCO, *West Greenland Salmon Fishery Measures*, online <http://www.nasco.int/wgc_measures.html> (accessed 16 February 2011).

²¹¹ See NASCO, Report of the ICES Advisory Committee, CNL (10) 8, Annex 11 of *NASCO Report of the Twenty-Seventh Annual Meeting of the Council, Quebec City, Quebec, Canada, 1-4 June 2010*, CNL(10)47, 9-10, online: NASCO <<http://www.nasco.int/reports.html>>. In its advice of April 2011, ICES announced a 2010 reported catch of 40 tonnes from the West Greenland Commission Area (NASCO, Report of the ICES Advisory Committee (ital), CNL(11)8, online: NASCO <[http://www.nasco.int/pdf/2011%20papers/CNL\(11\)8.pdf](http://www.nasco.int/pdf/2011%20papers/CNL(11)8.pdf)>).

²¹² See NASCO, *Report of the Twenty-Seventh Annual Meeting of the Council*, *ibid.* at 9-10.

²¹³ French authorities reported a provisional 2009 catch from the St. Pierre and Miquelon salmon fishery of 3.464 tonnes, the second highest in the ten-year time series. See NASCO, *Information from the French Authorities on the St. Pierre and Miquelon Salmon Fishery*, CNL(10)34, Annex 23 of *Report of the Twenty-Seventh Annual Meeting of the Council*, *ibid.*

²¹⁴ For the latest review of the SALSEA Programme, see NASCO, *Report of the Ninth Meeting of the International Atlantic Salmon Research Board*, CNL(10)9, online: NASCO <<http://www.nasco.int/sas/reports.htm>>. Canada has specifically noted the many question marks SALSEA research still leaves regarding reasons why salmon return in smaller numbers every year. See Opening Statement Made by Canada in *Report of the Twenty-Seventh Annual Meeting of the Council*, *ibid.* at 29-31.

²¹⁵ For a report describing trends in sea temperature and salinity changes in the North Atlantic region but not discussing marine ecosystem impacts, see S.L. Hughes, N.P.

may directly or indirectly affect the survival and behavior of Atlantic salmon.²¹⁶

In light of the endangered status of not only iBoF salmon stocks but other populations as well,²¹⁷ Canada will likely face increasing pressures to confront difficult questions regarding the future of NASCO. Should the NASCO convention be modernized to reflect key sustainability principles, such as precaution and the ecosystem approach?²¹⁸ Is it politically feasible to expand the regulatory functions of NASCO? Might at least some of the existing guidelines be strengthened and made mandatory? How might national reporting and accountability be further bolstered?

NASCO itself has set in motion review processes where future directives will be explored. At the 2010 Annual Meeting, NASCO's Council agreed to establish a 'Next Steps' Review Group to further assess implementation efforts, to review the reporting and evaluation process, to identify any additional areas that might need to be addressed so NASCO can meet the management challenges, and to develop proposals for an external review.²¹⁹ The Council has also committed to establish a panel of external experts to undertake a further performance review of NASCO with the terms of reference to be agreed upon at the 2011 Annual Meeting of NASCO.²²⁰

5. CONCLUSION

While SARA offers a cascade of promises for the protection of marine species at risk, this Atlantic salmon case study demonstrates the limitations to date in implementation practice. Trickle of protection rather than a "steady flow" of protective currents seem evident with the considerable generality of the Recovery Strategy for endangered iBoF Salmon, the limited identification of critical habitat, the failure to clearly extend legal protection to critical habitat, and the foggy future left as to the timing and content of action plans.

Protection of aquatic species at risk is a challenging task. SARA has undoubtedly more powerful effects on aquatic species than on terrestrial species, with prohibitions on individuals and residences applying automatically after listing in

Holliday & A. Beszczynska-Möller, eds., *ICES Report on Ocean Climate 2009*, ICES Cooperative Research Report No. 304 (2010).

216 The United States raised the issue of limited scientific and technical information regarding renewable energy sources at the 27th Annual meeting of NASCO in June 2010 and requested information from other countries. See "Emerging Threats and Opportunities in the United States", NASCO, CNL(10)40, online: NASCO <[http://www.nasco.int/pdf/2010%20papers/cnl\(10\)40.pdf](http://www.nasco.int/pdf/2010%20papers/cnl(10)40.pdf)>.

217 See *supra* note 8 and accompanying text.

218 For a review of management implications flowing from the principles, see Dawn A. Russell & David L. VanderZwaag, "Ecosystem and Precautionary Approaches to International Fisheries Governance: Beacons of Hope, Seas of Confusion and Illusion" in Russell & VanderZwaag, *supra* note 192 at 25.

219 See NASCO, *Terms of Reference for a Review of the "Next Steps" Process*, and *Council Decision Concerning a Further Performance Review*, NASCO, CNL(10)48, Annex 19 of the *Report of the Twenty-Seventh Annual Meeting of the Council*, *supra* note 211.

220 *Ibid.*

the whole range of their distribution, and critical habitat protection required 180 days after identification. Additionally, the limited scientific data and understanding of ecosystem inter-relationships and critical marine habitats stand out as one of the most daunting challenges and represent a common constraint in living marine resources management.²²¹

Perhaps the greatest lesson to be learned from the Canadian Atlantic salmon at risk story is the lack of “simple fixes” with a complex array of challenges needing to be addressed. Key challenges within the SARA seascape include: forging a clear agenda for recovery actions; confronting limitations in incidental harm permitting and authorizations; strengthening protection of critical habitat; and sorting out the possible listing of additional Atlantic salmon populations under SARA and the relationship with iBoF recovery planning and action.

Strengthening protective nets outside SARA also seems crucial with this article highlighting the need to consider: bolstering environmental impact assessment in relation to the protection of wild Atlantic salmon; enhancing the participation and actions of provinces, possibly by invoking application of their endangered species legislation to salmon; ensuring full implementation of the integrated planning and marine protected area responsibilities set out in Canada’s *Ocean Act*; and charting future directions for enhancing the effectiveness of NASCO.

While some of these challenges may be partly met through regulatory follow-through under SARA²²² and more dedicated implementation efforts, at least five challenging limitations cry out for legislative amendment consideration. Legislative reform priorities include the need to: curb political discretion in the SARA listing process;²²³ flesh out the procedure and process for developing recovery strategies;²²⁴ establish statutory timelines for the development and issuance of action

²²¹ Dawn A. Russell & David L. VanderZwaag, “Challenges and Future Directions in Transboundary Fisheries Management: Concluding Reflections” in Russell & VanderZwaag, *supra* note 192 at 521.

²²² According to SARA, s. 41(4) and 49(2), the Governor in Council may, on the recommendation of the Minister after consultation with the Minister of Canadian Heritage and the Minister of Fisheries and Oceans, make regulations prescribing matters to be included in a Recovery Strategy or action plan. According to s. 73(10), in turn, the Minister may, after consultation with the Minister of Canadian Heritage and the Minister of Fisheries and Oceans, make regulations respecting the entering into of agreements, the issuance of permits and the renewal, revocation, amendment and suspension of agreements and permits.

²²³ Similar amendment suggestions have been put forward by Ecojustice, David Suzuki Foundation and Nature Canada (House of Commons, Standing Committee on Environment and Sustainable Development, 40th Parliament, 3d Session, Evidence of Meeting on Tuesday April 27, 2010) and by Scott Findlay and Arne Mooers (House of Commons, Standing Committee on Environment and Sustainable Development, 40th Parliament, 3d Session, Evidence of Meeting, May 4, 2010).

²²⁴ Procedural and substantive amendments to the recovery strategy and action plan stage have been proposed by the Species at Risk Advisory Committee (House of Commons, Standing Committee on Environment and Sustainable Development, 40th Parliament, 3d Session, Evidence of Meeting on Tuesday June 2, 2009); Ecojustice, David Suzuki Foundation and Nature Canada, *ibid.*, Scott Findlay, Lance Barrett-Lennard, Michael

plans;²²⁵ impose a procedural check or checks on issuance of incidental harm permits and authorizations;²²⁶ and restrict the discretion to exempt activities from SARA's prohibitions and incidental harm permitting through recovery strategy statements.²²⁷

An aspect pervasive to the implementation of SARA has been the discretion left to the competent Ministers in some key aspects of the recovery process, a discretion that often cedes in favor of economic and social interests. It seems apparent from this article and from the broader review of SARA that the balance between required flexibility and the spirit of SARA to establish a prescriptive protection for species at risk is an area that still needs to be worked out. An issue warranting further public and political debate is the appropriateness of the Minister of Fisheries and Oceans serving as the competent Minister for protecting aquatic species under SARA. The Minister continues to face potentially conflicting mandates, to effectively protect species at risk while at the same time being responsible for managing commercial fisheries and promoting and managing aquaculture development.²²⁸

Saving Atlantic salmon populations will need much more than law reforms and better law and policy implementation. As the article in this volume by David Suzuki eloquently highlights, the philosophical vision of salmon as sacred needs to infiltrate political, public and bureaucratic attitudes. The observation of VanderZwaag and Hutchings, made soon after SARA entered into force, still rings true: "Society as a whole has to move from a 'deathbed' approach to conservation towards 'holistic health' where humans live within the bounds of ecological integrity and biodiversity richness."²²⁹

Pearson, and Arne Mooers (House of Commons, Standing Committee on Environment and Sustainable Development, 40th Parliament, 3d Session, Evidence of Meeting, May 4, 2010).

225 This proposal has been put forward by Ecojustice, David Suzuki Foundation and Nature Canada, *ibid.*, and Scott Findlay, *ibid.*

226 VanderZwaag & Hutchings, *supra* note 25 at 244.

227 *Ibid.* at 232.

228 David VanderZwaag, Gloria Chao & Mark Covan, "Canadian Aquaculture and the Principles of Sustainable Development: Gauging the Law and Policy Tides and Charting a Course — Part II" (2003) 28 Queen's L.J. 529, at 572.

229 VanderZwaag & Hutchings, *supra* note 25 at 245.