



The SOS Marine Conservation Foundation

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February 26, 2010

Mr. Trevor Swerdfager

Director General, Aquaculture Management

By e-mail: aquacultureconsultations@dfo-mpo.gc.ca & trevor.swerdfager@dfo-mpo.gc.ca

Re: Development of new regulation and regulatory framework for the management of aquaculture in B.C.

Dear Mr. Swerdfager,

The SOS Marine Conservation Foundation (SOS Foundation), through the *Save Our Salmon Initiative*, works collaboratively with government and other organizations to create a strategic approach to aquaculture that will achieve the two fundamental goals:

- Protect B.C.'s wild salmon stocks and the marine environment from the negative impacts of open net-cage salmon farms, and
- Establish B.C. as a leader in creating a globally renowned, stable and viable salmon aquaculture industry.

On July 3, 2009, the SOS Foundation provided you with a discussion document titled *A Sustainable Future for BC Aquaculture: A Framework of Strategic Initiatives*, dated June 2009. In that submission we set out a three point plan to achieve these goals:

- Provide a more transparent and accountable licensing regime and effective enforcement;
- Create the conditions necessary for the industry to embrace technological innovation; and
- Immediately undertake steps to protect the most critical and threatened wild salmon stocks.

On December 10, 2009, representatives of the SOS Foundation's *Save Our Salmon Initiative's* Solutions Advisory Committee attended the Department of Fisheries and Oceans' (DFO) Federal Regulation in British Columbia for Aquaculture meeting in Campbell River, B.C. The Solutions Advisory Committee is a group of successful business leaders, entrepreneurs and philanthropists with a proven track record of identifying opportunities and solving difficult problems to create economic benefits. Biographies for the members of the Solutions Advisory Committee are attached.

This submission builds on the July 2009 submission and responds to the information provided at that meeting and the related Fisheries and Oceans Canada discussion document titled *Federal Regulation in British Columbia and National Strategic Action Plan Initiative for Aquaculture, Fisheries and Oceans Canada* (FOC Discussion Document).¹

1. Development of new regulation and regulatory framework for the management of aquaculture in B.C.

These comments are provided in response to the framework and sections as set out in the FOC Discussion Document.

FOC Discussion Document Section 2.1: Principles

The SOS Foundation commends Minister Shea's commitment to establish a federal regulatory regime governing aquaculture in B.C. pursuant to the *Fisheries Act*,² and the DFO for undertaking consultation on the development of the new regulatory regime. This is consistent with the first point in the SOS Foundation's plan - creating a more transparent and accountable licensing regime and effective enforcement.

In parallel, DFO is also leading a national exercise to advance environmentally and socially sustainable aquaculture development in Canada through the National Aquaculture Strategic Plan Initiative (NASPI). The intent of NASPI is "to complement existing regional and provincial strategies in an effort to foster sustainable industry growth and prosperity."³

While we are encouraged that NASPI may be interpreted consistently with the SOS Foundation's plan to create the conditions necessary for the industry to embrace technological innovation; it is essential that in the early stages of regulatory review, the relationship between the regulatory regime and industry growth be clear.

In DFO's general approach to federal regulation of aquaculture in B.C., two principles are imposed:

1. Consistency with the *Fisheries Act* mandate to support the protection of fish and fish habitat, the proper management and control of fisheries including aquaculture, and pollution prevention;
- ...
2. Consistency with the DFO's aquaculture management objectives regarding the sustainable growth of the industry:

¹*Federal Regulation in British Columbia and National Strategic Action Plan Initiative for Aquaculture*, Fisheries and Oceans Canada, November 2009, [Hereinafter: FOC Discussion Document].

²FOC Discussion Document, at p. 1.

³FOC Discussion Document, at p. 1.

- to create the conditions for the Canadian aquaculture industry to succeed and contribute to the creation of long-term jobs and economic prosperity in rural and coastal communities;
- to create a level regulatory playing field for the aquaculture industry nationally;
- to develop long-term strategic solutions to support the responsible growth of the sector based on a strong regulatory environment and sound science; and
- to build public confidence in the Government of Canada's management of the sector...⁴

These two principles highlight DFO's dual and potentially conflicting mandates to protect fish and fish habitat, pursuant to the *Fisheries Act* and policies such as *Canada's Policy for the Conservation of Wild Pacific Salmon*; and its management objects and related advocacy role to promote growth of the aquaculture industry.

This is a longstanding issue. In December 2000 the Auditor General of Canada concluded DFO was not carrying out its regulatory responsibilities to enforce the *Fisheries Act* with respect to salmon farming operations; there are shortfalls in research in monitoring to assessing the effects of salmon farming operations; and had no plan in place to manage risks and assess the potential cumulative environmental effects of proposals for new sites to expand the industry.⁵

We acknowledge that principles set out above call for “sustainable” growth, implicitly recognizing DFO's statutory responsibility for fish conservation and protection; however, **we recommend that the principles guiding the development of the new federal regulatory regime be revised to expressly prioritize the statutory obligation for DFO to protect fish and fish habitat over management objectives regarding growth of the aquaculture industry.**

⁴ FOC Discussion Document, at pp. 7-8.

⁵ Report of the Auditor General of Canada – December 2000, Chapter 30 Fisheries and Oceans, *The Effects of Salmon Farming in B.C. on the Management of Wild Salmon Stocks*, at paragraph 30.1, states:

30.1 Fisheries and Oceans Canada is managing the salmon farming industry on the basis that it poses an overall low risk to wild salmon and habitat. However, the Department is not fully meeting its legislative obligation under the *Fisheries Act* to protect wild Pacific salmon stocks and habitat from the effects of salmon farming. We found that the Department:

- is not fully carrying out its current regulatory responsibilities to enforce the *Fisheries Act* with respect to salmon farming operations;
- is engaged in research and is working with the Province of British Columbia (B.C.) to develop a regulatory framework for salmon farming, but there are shortfalls in research in monitoring to assessing the effects of salmon farming operations; and
- has not put in place a formal plan for managing risks and for assessing the potential cumulative environmental effects of proposals for new sites, should the decision be made to expand the industry.

Further, the conflict between DFO's mandates, whether real or perceived, contributes significantly to the lack of public confidence in the management of the aquaculture sector in B.C. **In order to demonstrate a commitment to prioritizing protection of fish and fish habitat, and mitigate the risk of conflicting managements, we urge serious consideration be given to the SOS Foundation's recommendations four through six in the SOS Discussion Document to create an independent Aquaculture Licensing Board and Aquaculture Practices Review Board.**⁶ There are many models of regulation of

⁶ SOS Discussion Document Recommendation Four:

We recommend that the Government with jurisdiction consider creating an independent Aquaculture Licensing Board (ALB) to:

- Recommend new site-specific and regional, ecosystem-based siting criteria that relies on available peer-reviewed and published scientific and traditional knowledge and takes into full consideration regional carrying capacity;
- Provide a mechanism for meaningful consultation with First Nations in licensing decision-making, through the development of a process and role for the ALB in conjunction with First Nations that reflects constitutionally protected aboriginal and treaty rights, the law on consultation with aboriginal peoples, a commitment to accommodation, and the goals of The New Relationship;
- Assess and advise on the regional carrying capacity and the cumulative impacts of licensing decisions;
- Recommend the removal and relocation of existing open net-cage salmon farms as required to comply with assessments pursuant to new ecosystem-based siting criteria; and
- Recommend site-specific and regional monitoring programs, including specifying responsibilities for the operator and government.

To transition to new siting criteria, the ALB would, in conjunction with Government, establish a program that provides salmon farmers that discontinue open net-cage containment systems and adopt closed containment methods with priority access to an expedited licensing approval process, operating sites, and longer licence terms.

The recommendations of the ALB should be made in writing with licensing authorities required by legislation or regulation to take the recommendations of the ALB into consideration. Specific powers of the ALB should include the ability to hold public hearings and retain experts, with licensing authorities required to provide written reasons for aquaculture licensing decisions that are inconsistent with the recommendations of the ALB.

We recommend that the members of the ALB be appointed by Cabinet with the criteria for nominations and appointments established to ensure independence and public confidence, including members nominated by First Nations and local communities.

SOS Discussion Document Recommendation Five:

We recommend that the Government with jurisdiction consider increasing transparency by creating a public record of written reasons for aquaculture-related licensing decisions and any information used in support of these decisions, including the recommendations of the ALB. The public record should be posted on a single, accessible public registry website containing all key documents, reports and decisions.

SOS Discussion Document Recommendation Six:

We recommend that the Government with jurisdiction consider jointly establishing an independent Aquaculture Practices Review Board (APRB) with a mandate to:

- Conduct a review of the salmon aquaculture regulatory regime and make recommendations to the Government. The review should include all applicable legislation, regulation and policies and build on the foundation of work already completed by previous reviews, such as the review by the Environmental Assessment Office.
- Conduct complaint investigations regarding stewardship plans, site plans, practices, industry compliance and government enforcement approaches.

natural resources and industries in Canada through licensing bodies; one example of a resource co-management board is the Nunavut Water Board which regulates the use of fresh water and the deposit of waste in Nunavut.

FOC Discussion Document Section 2.2: Application

The current regulatory system is based on a complex range of instruments, including legislation, regulation, policy and guidelines. The SOS Foundation concurs that the existing regulatory regime requires transparency and streamlining and supports the use of a single regulation to manage the sector. However, the discussion in this section of the FOC Document is at odds with section 2.10, which suggests heavy reliance on policies and guidelines to support key aspects of aquaculture regulation:

The following is a partial list of issues that could be addressed in policies and guidelines supporting the application of the Aquaculture Regulation in B.C.:

- i. Publication of environmental performance and compliance information
- ii. Licence prerequisites
- iii. Finfish Containment
- iv. Finfish Escape Notification and Response
- v. Finfish Waste Management and Monitoring
- vi. Fish Health Management
- vii. Sea Lice Management in the Broughton
- viii. Fish Transfer
- ix. Reporting
- x. Record Keeping⁷

This heavy reliance on policies and guidelines, particularly for core issues identified in the current regulatory regime, such as finfish waste management and monitoring, is inconsistent with the DFO's express interest in transparency and streamlining set out in Section 2.2.

Moreover, issues such as the publication of environmental performance and compliance information are central to the transparency and accountability being called for in the new regulatory regime, as well as essential to support outside scientific evaluation of impacts

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- Issue special reports for matters of significant public interest which are not able to be dealt with via the complaint or audit process.
 - Carry out audits (field, report and data-based) of industry and government practices that impact the marine environment. This includes compliance with environmental management plans.
 - Report publicly on the results of any audits or reviews.
 - Administer a "B.C. Eco-Friendly" certification program that certifies and markets salmon aquaculture products grown according to the highest quality standards and using closed containment technology consist with the "highest environmental standards and the best managed fishery bar none".

We recommend that members of the APRB be appointed by Cabinet with established criteria for nominations and appointments to ensure independence and public confidence, including members nominated by First Nations and local communities.

⁷ FOC Discussion Document, at p. 13.

on wild salmon and the marine environment. When combined with the statement that “It should be noted that the discussion on the details of policies such as those listed above are outside the scope of the current consultations”, the extent and nature of the commitment to establish a federal regulatory regime governing aquaculture in B.C. pursuant to the *Fisheries Act* becomes increasingly unclear.⁸

Accordingly, we recommend that DFO focus on the development of a core regulation which establishes science-based siting criteria, thresholds and limits for effects beneath and beyond the farm, including on wild salmon and other exposed marine life, and the related sampling, monitoring and remediation requirements. Core regulation should also address the prevention and monitoring of bycatch and impact on predators, on a basis consistent with the approaches used in the commercial and sports fisheries.

In addition, the core regulation should address mandatory, public reporting requirements for parasites, pathogens, therapeutants and chemicals used when they may enter into the marine environment.

We also note the ambiguity related to the regulation of land-based aquaculture grow-out facilities.⁹ **Given the importance of this rapidly evolving sector to the protection of wild salmon and the growth of the aquaculture sector, we recommend that regulatory clarity for these grow-out facilities be prioritized.**

FOC Discussion Document Section 2.3: Licence and Licence Conditions

The creation of an independent Aquaculture Licensing Board and an Aquaculture Practices Review Board as set out above are increasingly important when licences and licence conditions are intended to be the principle management tool for aquaculture in B.C.¹⁰ Adopting these recommendations will signal Canada’s intention to respond seriously to the current wild salmon crisis in B.C. and are essential to build public confidence in the Government of Canada’s management of the aquaculture sector.

Here also, the intention to rely on general conditions for licenses to be contained in supporting policies rather than regulatory schedules is noted and the recommendations set out in section 2.2 reiterated.¹¹

FOC Discussion Document Section 2.4 Pollution Prevention Measures

The proposed regulatory measures in this section, including establishing thresholds for allowable concentration, quantity or other conditions for the release of substances into water, and related mitigation, monitoring and reporting requirements, are more consistent with the approach recommended in section 2.2. **We recommend the thresholds and**

⁸ FOC Discussion Document, at p. 14.

⁹ FOC Discussion Document, at p. 8.

¹⁰ FOC Discussion Document, at p. 8.

¹¹ FOC Discussion Document, at p. 10.

limits be independently established, science-based and allow for stricter licence specific conditions depending on siting and risk management considerations, including cumulative effects.

FOC Discussion Document Section 2.5 Notification and Reporting

Currently the federal *Health of Animals Act* does not list any fish diseases as reportable. In 2007 approximately 70% of the Norwegian-operated fish farm industry in Chile was wiped out by an outbreak of the Infectious Salmon Anemia (ISA) virus, leaving environmental and economic devastation in its wake. Chile was the second biggest producer of farmed salmon; however, its output has plunged more than 75% in two years. At peak production in 2008, Chile sold 403,000 tonnes, with a forecast for sales in 2010 estimated at 90,000 tonnes.

Canada's regulation does not follow international standards for aquatic animal health control measures. Of great concern is that DFO does not routinely test for ISA in Atlantic salmon hatcheries and the industry is not required to report, immediately or annually, ISA. With open net-cage aquaculture, B.C.'s marine environment is susceptible to the introduction and spread of diseases such as ISA, putting Pacific wild stocks at risk and leaving the farmed salmon industry and local economies vulnerable to extreme economic impacts, including export market closures. **Accordingly, we recommend that immediate, mandatory reporting for pathogens including ISA and IHN be established by regulation under the *Fisheries Act* or the *Health of Animals Act* and made reportable to the public. In addition, the core regulation should address mandatory, regular public reporting requirements for parasites, and mandatory, advance, public reporting requirements for therapeutants and chemicals used when they may enter into the marine environment.**

FOC Discussion Document Section 2.6: Enforcement and Section 2.7: Inspections & Audits

In addition to the formation and role of an Aquaculture Practices Review Board set out above, recommendations seven through ten in the SOS Discussion Document set out mechanisms to ensure public confidence in the inspection, audit and enforcement provisions of the regulations.¹²

¹² **SOS Discussion Document Recommendation Seven:**

We recommend that the Government with jurisdiction consider placing all salmon aquaculture-related enforcement actions and decisions on the public record using a single, accessible public registry website containing all key documents, reports and decisions (i.e. consistent with non-compliance reporting on the B.C. Government's Liquor Control and Licensing Branch's website).

SOS Discussion Document Recommendation Eight:

We recommend that the Government with jurisdiction consider conducting a review to ensure that licensing authorities have the full range of regulatory tools for effective enforcement and to flexibly respond to changing conditions and emerging scientific evidence.

It is also essential that the inspection and enforcement provisions of the regulations be adequately funded; taking into consideration the fact that aquaculture in B.C. takes place over a geographically wide range and in relatively remote areas of the coast.

FOC Discussion Document Section 2.8: Attestation of Regulatory Compliance & Monitoring Results

We recommend that information on regulatory compliance and monitoring history of a licence holder be in the public domain, removing the need for DFO to provide attestation. In any event, any DFO attestation regarding a licence must be public.

FOC Discussion Document Section 2.9: Fees

The fee structure should be established in concert with the requirement that the regulatory regime be adequately funded. Funding must be adequate to fulfill DFO's mandate, provide for the cost recovery of cumulative effects and coast-wide monitoring to ensure the conservation and protection of fish and fish habitat, and giving due consideration to the value of the marine environment as a public resource.

FOC Discussion Document Section 2.10: Policies & Guidelines Supporting the Regulation

Please see the recommendations set out in section 2.2. **Further, we recommend that item vii. "Sea Lice Management in the Broughton", be expanded to include other regions with a high density of open net-cage farms, such as the Discovery Islands and Clayoquot Sound.**

SOS Discussion Document Recommendation Nine:

We recommend that the Government with jurisdiction consider identifying and enacting specific legislative, regulatory and policy enhancements that ensure that the impacts of aquaculture operations on wild salmon are negligible and as a minimum result in no-net-loss of local habitat. This may require alignment and harmonization of federal and provincial regulations.

SOS Discussion Document Recommendation Ten:

We recommend that the Government with jurisdiction consider making the necessary legislative, regulatory and program amendments to consolidate and protect the integrity of aquaculture compliance and enforcement programs, including:

- Consolidating licensing, inspections and enforcement functions and staff (i.e. integrated, multi-agency approach to licensing, compliance and enforcement).
- Creating a distinct organizational separation of aquaculture licensing, compliance and enforcement from industry economic development functions.
- Implementing a transparent and workable administrative enforcement framework (hearing and adjudication process) that deals effectively and expeditiously with infractions in lieu of formal court proceedings. This includes appropriate administrative powers, including the authority to:
 - Temporarily suspend or revoke a licence;
 - Issue fines; and
 - Add or amend licence terms and conditions.
- Reviewing the penalty regime to ensure it is meaningful and consistent with other natural resource regulatory regimes (e.g. mining and forestry).

2. The Need to Immediately Undertake Steps to Protect the Most Critical and Threatened Wild Salmon Stocks.

We understand that the earliest the new regulatory regime could be in effect in B.C. is October or November 2010. During this process, we urge DFO to proceed with the third strategic action – immediately undertake steps to protect the most critical and threatened wild salmon.

In addition to recommendations made previously to continue implementing a fallowing strategy for the Broughton Archipelago, the SOS Foundation supports the call for emergency risk management measures to protect the next generation of Fraser River salmon which must migrate through a constrained passage area with a high density of open net-cage salmon farms. Immediate harvesting of adult fish in key farms as an emergency risk management measure will reduce the pressure of sea lice transfer in at least one passage through the northern Georgia Strait as this year's juvenile Fraser River salmon make their way to the open ocean. The key farms are believed to be Venture Point (Mainstream), and Cyrus Rocks and Okisollo/Sonora (Marine Harvest); however, this is subject to confirmation of the current stocking of these farms. This information is not currently publicly available and is key to this risk management strategy.

This measure is consistent with a statement from a Simon Fraser University Think Tank of scientists regarding the management of declining Fraser River Sockeye salmon productivity, who in December 2009 recommended “precautionary measures such as experimentally removing farmed salmon from sockeye migration routes in the short term, even before the federal judicial inquiry is completed”.¹³ This should be accompanied by an independent sea lice monitoring program, modelled after the monitoring program implemented in the Broughton Archipelago in 2009, for migrating juvenile wild salmon as they pass through the Discovery Islands.

3. A Note on DFO’s National Exercise to Advance Environmentally and Socially Sustainable Aquaculture Development in Canada

While outside the scope of this submission, the SOS Foundation wishes to express its support for DFO undertaking initiatives to advance environmentally and socially sustainable aquaculture development in Canada. In addition to the evolving regulatory regime, action is needed to create incentives for industry to embrace the technological innovation that will lead to a sustainable aquaculture industry that can support the growth goals set out in NASPI.

With participation from DFO and the B.C. Ministry of Agriculture and Lands (BC MAL), the SOS Foundation has carried out a closed containment technology review to identify

¹³ *Adapting to Change: Managing Fraser sockeye in the face of declining productivity and increasing uncertainty*. Statement of Think Tank of Scientists, SFU, Vancouver, December 9th, 2010. The Think Tank recommended “precautionary measures such as experimentally removing farmed salmon from sockeye migration routes in the short term, even before the federal judicial inquiry is completed”.¹³

and evaluate the feasibility of closed containment technology.¹⁴ From this work, we have concluded that it is appropriate to support the development of demonstration projects to prove out key assumptions and the ability to grow out salmon in closed containment in commercial densities.

With financial support from BC MAL, the SOS Foundation partnered with the ‘Namgis First Nation to conduct a feasibility study for a land-based, closed containment salmon aquaculture project near Alert Bay, B.C. From the feasibility study, a decision was made to proceed with a request for proposals for detailed site assessment and the design of a 100 to 200 metric tonne facility, RFP for a detailed site assessment and design for the demonstration project to prove assumptions and set the stage for scale up to a 1000 metric tonne commercial facility.

In addition to the project with the ‘Namgis, we are aware of three other land-based, recirculating closed containment salmon aquaculture projects being proposed, including Marine Harvest Canada announcing the intention to design and secure funding for a commercial-scale closed containment pilot project early in 2010. A detailed work plan for the project is under development, including timelines for design, technical due diligence and finalizing an economic model to evaluate the sustainability performance of closed containment technology. The work plan is scheduled for completion by the end of March with a public announcement to follow. The project will be carried out in association with the Coastal Alliance for Aquaculture Reform.

In addition to the obvious environmental and ecosystem benefits of closed containment systems, there are a number of economic benefits of closed containment systems:

- Water temperature and oxygen control at optimum, allowing for a shorter production cycle from egg to harvest;
- Controlled conditions and close observation of feeding, resulting in overall better Feed Conversion Ratio and less waste;
- Allows for continuous and year-round harvesting;
- CO₂ produced by fish can be used for plant or algae production, and efficient use of fish by-products normally considered as organic waste all provide secondary revenue streams;
- Ability to process fish “pre-rigor” for a better quality final product; and
- A steady supply and sustainable fish products command higher prices.

These projects all face the challenge of seeking financing for the construction and operation of demonstration projects. The SOS Foundation is working closely with Tides Canada to provide incentives for these projects through the creation of a Finfish Aquaculture Innovation Fund of +\$15 million. To date, \$5 million of philanthropic investment is available provided matching contributions totalling \$10 million can be raised. These matching contributions could be accessed through existing incentive programs, new funding, or in kind contributions such as land, from B.C., Canada and industry partners. We urge DFO to work with Tides Canada to source these matching

¹⁴ “Technologies for Viable Salmon Aquaculture – An examination of land-based close containment aquaculture”. Available in March 2010 at www.saveoursalmon.ca.

contributions from existing or proposed programs in order to move the Innovation Fund and qualifying demonstration projects forward. More detailed information on the Innovation Fund can be provided by contacting Catherine Emrick, Senior Associate, Aquaculture Innovation at Tides Canada (catherine.emrick@tidescanada.ca).

Thank you for the opportunity to make this submission. Questions or clarifications may be addressed to my attention at eric@saveoursalmon.ca.

Sincerely,

[Original signed]

Eric Hobson
President
The SOS Marine Conservation Foundation

Save Our Salmon Initiative Solutions Advisory Committee Members

Eric Hobson graduated with distinction from Carleton University with a Bachelor Degree in Engineering. Following 10 years in the oil and gas industry, Eric moved into the fledgling energy marketing and trading business as co-founder and President of Northridge Petroleum Marketing. Northridge Petroleum Marketing was eventually sold to TransCanada Corp. Eric went on to co-found Metronet Communications Inc., which grew into a large, national telecommunications company, ultimately merging with AT&T Canada in 1998. Eric then became President of E-Zone Networks, the largest private network in the world by 2001. Northridge Petroleum Marketing, Metronet and E-Zone were financed and managed through Northridge Canada Inc., of which Eric has been a partner since 1986. Northridge Canada has founded more than 50 companies since its inception in 1986.

Since 2001, Eric has been an independent investor and director of numerous private, public and charitable organizations. He is an active philanthropist, co-founding The Community Opportunity Foundation of Alberta in 1999 and directing the Save Our Salmon Initiative since its inception. Eric and his wife Susan spend summers at their home near Duncan. His love of the ocean comes from many childhood summers fishing near Vancouver Island with his father and grandfather.

Judy Gale grew up on the B.C. coast, graduating with a Bachelor of Arts from the University of British Columbia and a Master of Business Administration from Simon Fraser University. Traveling the world helped Judy to recognize the uniqueness and underlying value of B.C.'s coast and the importance of conserving it. Judy is the founder and President of Blue Planet Links Foundation, an education and environmental foundation with a global focus on promoting healthy oceans and fresh waters. She is also a published non-fiction author.

Judy co-chairs the Board of Directors of The KidSafe Project Society, a non-profit society that provides at-risk inner-city children with learning opportunities, nutrition, recreation and a safe place to be when schools are closed. As a Partner in BC Social Venture Partners, Judy uses her years of experience as a corporate manager and owner of a successful small business and corporate communications to help fund and mentor non-profit organizations.

Rupert Gale is the Fisheries Program Manager for the Ritchie Foundation and focuses on the restoration of salmon as well as a vibrant and sustainable recreational fishery within the Georgia Basin. Rupert has a Bachelor of Arts degree in economics from the University of Victoria and attended the School of Resource and Environmental Management at Simon Fraser University. Rupert sits on the boards of several organizations including the Living Rivers Georgia Basin/Vancouver Island and the Centre for Aquatic Health Sciences.

Prior to his current work, Rupert operated a fishing charter business in the Stuart Island area for over 20 years and is familiar with the many changes that have occurred with the salmon resource since the 1980s. Rupert maintains a strong connection to the recreational fishing community in southern B.C., and is a member of the executive of the Sport Fishing Advisory Board.

F. Lee Green co-founded and was CEO & Chairman of Triple G Systems Group, Inc. of Toronto, a global leader in medical laboratory information systems software. Under Lee's leadership, Triple G grew from pre-revenue to \$25 million in revenue, with 80% generated outside Canada. The company was listed on the TSX in 2001 and was acquired by GE Medical Systems in 2003 for \$83 million.

Lee grew up on Vancouver Island and spent his youth on the water in B.C. As a passionate fisherman, upon moving his family home to Victoria in 2004, he was alarmed by the changes he observed in wild salmon stocks on the B.C. south coast. Lee became actively involved in the Save our Salmon Initiative as he felt it took a reasoned and balanced approach to protecting B.C.'s wild salmon stocks.

Willie Mitchell is a defenceman with the Vancouver Canucks and has played in the NHL since the 2000/2001 season. Willie was born in Port McNeill, and, when not playing hockey, continues to spend time there enjoying all the North Island has to offer. Willie's most memorable moment away from the hockey rink is catching a 50-pound salmon with his Dad at Rivers Inlet, B.C.

After reading and spending time with scientists, anglers and First Nations in the Broughton Archipelago, Willie decided that immediate action is needed to address the devastating impact of high density open net-cage salmon farms located on critical salmon migratory routes in the Broughton Archipelago. Working with the Save Our Salmon Initiative to ensure B.C.'s wild salmon is protected for future generations is one of several philanthropic commitments Willie has made to his home province.

Eric Patel brings the SAC his extensive experience in strategy, finance and operations with companies ranging from Fortune 100 conglomerates to start-ups in the US, Europe and Canada. He is currently the Chief Financial Officer of Pembroke Mining, serves on the Board of Directors for Ritchie Bros. Auctioneers and is on the Advisory Board of ACL Services. Eric earned a Masters of Business Administration in Finance from Stanford University's Graduate School of Business and obtained his Bachelor of Arts in Environmental Policymaking from Brown University. Prior to his current roles, Eric was CFO and helped lead the turnaround of Crystal Decisions (now Business Objects/SAP), one of the world's premier business intelligence software companies.

Eric is passionate about the potential to create a world-class sustainable salmon aquaculture industry in B.C.

Alexander Pourbaix is the President of TransCanada Corporation Energy. He is responsible for TransCanada's non-regulated businesses, including power, gas storage, liquefied natural gas and compressed natural gas. He is also responsible for the operation of Cancarb Limited, a carbon black manufacturing business owned and operated by TransCanada. Prior to his current appointment, Alexander was Executive Vice-President, Power for TransCanada. He currently serves as Chairman and Director of TransCanada Turbines Ltd., an aeroderivative turbine overhaul and repair business.

Mr. Pourbaix is a recipient of Canada's Top 40 Under 40 Award for leadership excellence for Canadians under the age of 40. He is a Director of Junior Achievement of Southern Alberta, and serves on the Board of Management for the Alberta Economic Development Authority. Mr. Pourbaix holds a Bachelor of Arts, with distinction, and a Bachelor of Law from the University of Alberta.

Ivan Thompson is the B.C. Program Officer for the Wild Salmon Ecosystem Initiative of the Gordon and Betty Moore Foundation. The Foundation was established in September 2000 with a \$5.8 billion endowment by Intel co-founder Gordon Moore and the Foundation reflects his science-based, results-driven orientation in striving to improve the quality of life for future generations. The goal of the Wild Salmon Ecosystem Initiative is to maintain a healthy salmon ecosystem at the scale of the North Pacific by investing approximately \$25 million per year in habitat protection, sustainable fisheries and improved aquaculture practices in British Columbia, Alaska and Kamchatka (Russia).

Prior to joining the Moore Foundation in 2007, Ivan worked as a Senior Advisor to the Tides Canada Foundation and as Community and Economic Advisor to ForestEthics in the campaign that led to the protection of the Great Bear Rainforest of British Columbia. This campaign raised \$120 million in public and philanthropic funding for conservation management and ecosystem-based economic development.

Dr. Andrew Wright graduated from the University of Hull, England with a first class honors Bachelor of Science, a Diploma of Engineering and a Doctorate in Microwave Engineering. He has published numerous IEEE peer-reviewed research papers and has been awarded over 50 patents. After emigrating to Canada, Dr. Wright co-founded and was CTO of Datum Telegraphic Inc. Datum was subsequently acquired by PMC-Sierra. He is currently a Director of Actenum, Zymeworks, and Pharos Capital and a co-founder of Aegis Mobility.

Dr. Wright is an active angel investor and philanthropic activist for inner city child education enrichment programs. He is also a proponent of environmental stewardship initiatives. He is a lead donor for the Tides Canada Great Bear Rainforest initiative which promises to be a model for world conservancy. Upon visiting the Broughton Archipelago and witnessing the impact of open net-cage salmon farming, he has become an advocate for improving salmon aquaculture practices on the West Coast.

Catherine Emrick is the Senior Associate, Aquaculture Innovation for Tides Canada. Previously the Program Director with the SOS Marine Conservation Foundation, Catherine helped to develop business-oriented solutions to the negative impacts of open net-cage finfish aquaculture and a strategy to build a sustainable aquaculture industry in B.C.

She holds a Bachelor of Laws and Master of Business Administration from the University of Calgary, and is a Certified General Accountant. In addition to her work with Tides, Catherine practices environmental, regulatory and administrative law in Alberta and the North. She works closely with boards and regulators and has successfully mediated complex, multi-party matters.

In honour of the 100th anniversary of the founding of the CGA designation, Catherine was chosen by CGA Canada as one of the 100 CGAs who have made an outstanding contribution to their communities and the lives of others.