



Fourth Industry Action Plan

2011/2015

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**Inter-Provincial Partnership for
Sustainable Freshwater Aquaculture Development**

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EXECUTIVE SUMMARY

Canada's freshwater aquaculture sector consists of more than 700 operations that produce more than 10,000 metric tonnes of output annually with a farm-gate value of approximately \$70 million. Located in every province of the country, the majority of these operations are land-based facilities where fish are reared in ponds, tanks and/or raceways. There are also approximately one dozen cage culture operations located in lakes and reservoirs; the latter account for more than 45% of total production. Trout and charr are the principal production species.

Globally, Canada ranks a distant 13th in total freshwater trout and char output; however, given our natural resource base and other strategic advantages, this level of output is not commensurate with the opportunity, or potential, that exists. Growth in the sector has been forestalled due largely to concerns regarding the environmental and social sustainability of aquaculture. *Therefore, any expansion in the Canadian freshwater aquaculture sector is dependent upon the development of knowledge, technologies and practices to address and resolve such challenges.*

In 2001, producers in different provinces with similar challenges launched the *Inter-Provincial Collaborative R&D Initiative for Sustainable Freshwater Aquaculture* (the Initiative) to promote coordinated efforts in applied research, development and commercialization (RDC) to advance the sector. The Initiative's first Industry Action Plan, in 2002, focused largely on nutrition. In 2004, priorities were re-evaluated and a second Industry Action Plan was developed with a renewed focus on nutrition but with the addition of waste management, farm management and environmental carrying (assimilative) capacity. In total, more than \$1.9 million in RDC projects were delivered through these first two Action Plans.

In 2006, the Initiative became a registered not-for-profit organization – the *Inter-Provincial Partnership for Sustainable Freshwater Aquaculture Development* (IPSFAD) - with headquarters in Quebec City, QC. The same year, the IPSFAD consolidated stakeholder input to generate the Third Industry Action Plan which served as a coordinating instrument for sustainable freshwater aquaculture development throughout Canada from 2007-2010. The total cost of the projects implemented under the Third Industry Action Plan was approximately \$5.2 Million.

In 2011, IPSFAD's Fourth Industry Action Plan (2011-2015) became a coordination of the goals and objectives of the DFO's NASAPI, the SORDAC's Strategic Planning and the NOAA's Strategy for Sustainable Aquaculture Development in Ontario. This Fourth Action Plan will be an important tool that will guide the IPSFAD toward meeting its Objectives for 2011-2015. This new Plan continues to reflect a consolidation from industry and stakeholder consensus regarding those research, development and commercialization issues requiring priority attention.

1. IPSFAD MISSION & OBJECTIVES

Mission:

To promote sustainable development of freshwater aquaculture in Canada.

Objectives:

- 1. Create consensus regarding applied research, development and commercialization (RDC) priorities identified by industry.*
- 2. Promote applied research, development and commercialization projects and assemble required research and/or technology transfer expertise for execution.*
- 3. Foster the establishment of necessary synergies among various players while avoiding duplication of work and making optimal use of resources.*
- 4. Organize and seek funding for projects that result directly from priorities identified by industry.*

2. THIRD INDUSTRY ACTION PLAN – 2007-2010

The Third Industry Action Plan of the Inter-Provincial Partnership for Sustainable Freshwater Aquaculture Development (IPSFAD) was intended to focus applied research, development and commercialization (RDC) efforts on those issues that can best enhance productivity and prosperity within the sector. Pure research is not within the scope of IPSFAD's activities.

In the autumn of 2006 and early winter of 2007, the IPSFAD coordinated five 1-day workshops with industry and government stakeholders to solicit input regarding those RDC initiatives deemed to be most pertinent to industry development and to once again update and prioritize sectoral challenges and opportunities. Meetings were held in Alberta¹, Québec, British Columbia and Ontario, and a pan-Atlantic meeting was held in New Brunswick. At each workshop, an identical process was followed, as outlined below:

- Status of aquaculture development in the province / region
- Overview of IPSFAD and results of past projects
- Identification of fundamental challenges and opportunities
- Overview of potential RDC projects
- Prioritization of potential RDC projects

¹ Stakeholders from Saskatchewan and Manitoba participated in the Alberta meeting.

The workshops successfully identified stakeholder perspectives on the fundamental RDC issues in each region, including identification of specific project objectives. Consolidation of stakeholder input from these meetings was the foundation for a renewed three-year Industry Action Plan that served as a coordinating instrument for sustainable freshwater aquaculture development throughout Canada from 2007-2009.

The total cost of the projects implemented under the Third Industry Action Plan was \$5.2 Million. Funding was provided by Fisheries & Oceans Canada's Aquaculture Cooperative Research & Development Program (ACRDP) and Aquaculture Innovation and Market Access Program (AIMAP). Additional funding was provided by the Ministère développement économique, l'innovation et l'exportation (MDDEP), the Société de recherche et de développement en aquaculture continentale (SORDAC) inc., the Industrial Research Assistance Program (NRC-IRAP), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Réseau Aquaculture Québec (RAQ).

3. FOURTH INDUSTRY ACTION PLAN – 2011-2015

In 2010, IPSFAD's Board of Directors was prudent and requested that IPSFAD's Fourth Industry Action Plan (2011-2015) would be coordinated with the goals and objectives of the National Aquaculture Strategic Action Plan Initiative, the Société de recherche et de développement en aquaculture continentale inc's Strategic Planning and the Northern Ontario Aquaculture Association's Strategy for Sustainable Aquaculture Development in Ontario.

1. In 2010, the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM) led the National Aquaculture Strategic Action Plan Initiative (NASAPI), a collaborative exercise to enhance and advance economically, environmentally and socially sustainable aquaculture development. The NASAPI includes five strategic actions plans that pertain to the five regionally distinct aquaculture sectors in Canada: East Coast marine finfish, East Coast shellfish, National freshwater, West Coast marine finfish and West Coast shellfish.

The NASAPI strategic action plans outline areas where efforts are required to improve public governance of aquaculture and private operations (although not all of the action items within the plans necessarily apply to all provinces and territories). Effective, well-communicated governance enhances public confidence in government oversight of industry activities, leading to an improved social licence—and in turn, to increased investor confidence in aquaculture, which will stimulate responsible and sustainable growth that creates economic prosperity.²

² National Aquaculture Strategic Action Plan Initiative - Freshwater Sector Strategic Action Plans 2011–2015
<http://www.dfo-mpo.gc.ca/aquaculture/lib-bib/nasapi-inpasa/index-eng.htm>

2. The Société de recherche et de développement en aquaculture continentale inc (SORDAC) consulted its members recently in order to complete its strategic planning for the period 2010-2015. Since their last strategic planning for the period of 2005-2008, the aquaculture industry has evolved as well as its environment. To accomplish this renewal, all the SORDAC members were asked to contribute in determining the current major issues hindering the freshwater aquaculture in Quebec. This exercise generated a collective vision of the Quebec industry, and ensured stability and continuity for the SORDAC Strategic Planning. With this new Strategic Planning the SORDAC members will be have a better understanding of the SORDAC research objectives.
3. In the recent years, the Northern Ontario Aquaculture Association (NOAA) has championed the exercise to develop a Strategy for Sustainable Aquaculture Development in Ontario. Throughout the strategic planning process, representatives of the federal and provincial governments, industry producers and suppliers, and community stakeholders were consulted to provide input to guide analyses and decisions. The Strategy for Sustainable Aquaculture Development in Ontario, and its accompanying Action Plan, is intended to reflect a balanced and shared industry-government commitment to sustainable development. It provides a blueprint to guide research, development, investment and policy pertaining to aquaculture over the coming decade.

On February 16th 2011, IPSFAD coordinated a meeting with industry and government stakeholders to solicit input regarding the proposed draft Action Plan for 2011-2015 and to update and prioritize the presented Research, Development and Commercialisation initiatives. The past Action Plan 2007-2009, the worked accomplished at various recent regional meetings, and the stakeholder input from this meeting were the basis for the renewed four-year Industry Action Plan that will serve as a coordinating instrument for sustainable freshwater aquaculture development throughout Canada from 2011-2015. This new Action Plan addresses an even broadened range of themes related to sustainable freshwater aquaculture development in Canada.

To consolidate resources and effort in those areas where interests, challenges, needs and opportunities were similar, 27 RDC initiatives were re-distributed within eight thematic groups:

Fish Health Management	RAS & Emerging Technologies
Nutrition	Cage Culture
Broodstock Management	Risk Management
Alternative Species and Practices	Social License

In pursuit of its Mission to promote sustainable development of freshwater aquaculture in Canada, this Action Plan will be an important tool that will guide the IPSFAD toward meeting its Objectives for 2011-2015. This new Plan will reflect a consolidation from industry and stakeholder consensus regarding those research, development and commercialization issues requiring priority attention. It will facilitate the implementation of RDC initiatives in the freshwater aquaculture sector.

Theme 1 – Fish Health Management

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
Promote the development of vaccines, antibiotics, and non-antibiotic therapeutic agents (e.g. for control of external pathogens) required for effective management of cold water disease, columnaris, furunculosis, fungal disease and, if necessary, VHSV.		X
Comparatively evaluate potential products based on their efficacy in fish farming and their likelihood for Canadian regulatory approval		X
Provide scientific support to advance regulatory approval of potential products for use with commercial aquaculture species.	X	X
Develop a business case to support product registration. Products available for use in aquaculture in other jurisdictions or that are approved for use in Canada in other sectors should be given priority.	X	X
Develop on-site diagnostic kits for specific disease e.i. furunculosis		X

Theme 2 – Nutrition

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
IPSFAD will continue to support Canadian feed companies in their efforts to develop higher performing diets with reduced environmental impacts.	X	X
Keep updating files associated with the regulatory amendment that would enable lower phosphorus content in aquaculture diets via the support of CAWG's work.		X
Improvements in feeding strategy and feed delivery can also contribute significantly toward enhanced environmental sustainability in the sector. Reliance on standard feed charts to calculate rations remains a common practice, even though it has been proven to be inefficient. Improved methods to calculate feed rations are required and must reflect the high-energy diets used in the industry and the operational conditions at fish farms.	X	X
Develop predictive models for environmental performance based on feed formulation and utilization		
Promote the utilisation of alternative ingredient for trout feed	X	X

Theme 3 – Broodstock Management

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
Continue to work towards the development of a national broodstock program to develop enhanced performance in rainbow trout, specifically targeting improved fillet yield, enhanced growth rate and greater tolerance to warm-water conditions. Additional rainbow trout strains should be sought from local and/or imported stocks, taking into consideration the genetic characteristics (performance) of the target strains and their disease profile.	X	X

Theme 4 – Alternative Species & Practices

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
Support the development of commercially-viable arctic charr (1), walleye/perch (2), & sturgeon (3) aquaculture via the development of core technologies and practices (e.g. systems technologies, water quality requirements, nutritional requirements, broodstock development, etc.)		X

Theme 5 – RAS & Emerging Technologies

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
Implement the Performance Monitoring and Management Program (benchmarking program) at the Manitoba-Canadian Model Farm Project.	X	X
Support development of more model farms following CMAF model criteria (circular tanks to provide a comparison with the current raceway model farm project)		X
Support development of new technologies associated with water and farm waste treatment	X	X

Theme 6 – Cage Culture

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
Augment knowledge regarding the environmental impacts of cage culture		X
Quantify the environmental footprint, (e.g. carbon footprint, life-cycle analysis) of aquaculture subsectors and identify areas where investment into green technologies is most pertinent		X
Invest in research and development to advance cage aquaculture in high-energy / off-shore areas	X	X
Promote the development of freshwater Integrated Multi-Trophic Aquaculture		X

Theme 7 – Risk Management

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
Develop Best Management Practices (BMPs) for Fish Health that incorporate standard operating procedures (SOPs) and technologies for biosecurity and aquatic health for land-based and cage culture operations		X
Investigate the insurability of fish stock		X
Improve the access to capital		X
Investigate problems with invasive species		X
Investigate problem of genetic material transfer between provinces		X

Theme 8 – Social License

Projects	Possible ACTION for IPSFAD	
	Active promoter	Proposal support
Lead the development of certification standards for aquaculture in Canada	X	X
Improve communication to the general public	X	X
Promote social & economic contributions of Canadian aquaculture		X

4. CONCLUSION

This Fourth Industry Action Plan of the Inter-Provincial Partnership for Sustainable Freshwater Aquaculture Development in Canada reflects industry consensus regarding pertinent needs and challenges related to the major impediments affecting the acceptance, productivity and sustainability of the freshwater aquaculture industry in Canada.

Through implementation of the research, development and commercialization initiatives outlined in this Action Plan over the coming four-year period, it is envisaged that industry prosperity will increase and that a more collaborative, interdisciplinary approach will emerge amongst those stakeholders engaged in freshwater aquaculture research, development and technology transfer. As a direct result, Canadian aquaculture producers will be more competitive, more sustainable and better positioned to develop our inherent potential and take advantage of the opportunities that exist in all regions of this country.