

STRATEGY FOR SUSTAINABLE AQUACULTURE DEVELOPMENT IN ONTARIO



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INTRODUCTION

Over the past 10 to 15 years, global fish and seafood production has evolved dramatically. The demand from more numerous, more prosperous and more sophisticated consumers has outpaced traditional supplies from capture fisheries. In response, aquaculture, the farming of aquatic organisms, has emerged as a sustainable source of farm-raised products and, in the process, has had a substantial impact on transforming a generations-old industry.

Today, aquaculture is the fastest growing food production sector in the world. More than 50%¹ of all fish and seafood for human consumption (excluding fish meals and oils) is now derived from aquaculture. By 2020, the United Nations Food & Agriculture Organization predicts that aquaculture's contribution to global seafood supply will surpass 62%, reflecting extraordinary potential in the sector and the inability of capture fisheries to increase production.

Aquaculture is not only transforming the supply of fish and seafood, it is also having a significant impact on consumption. In the US, Canada's largest seafood export market, farm-raised species now account for more than 43 percent of total seafood consumption – and more than 50% of all non-canned product. By producing a consistent, quality product on a year-round basis, the aquaculture sector is able to provide consumers with superior convenience and value.

As a non-extractive, renewable agri-food sector, aquaculture provides considerable benefits to all Ontarians. The sector offers real potential for strategic job creation, particularly in rural and coastal communities, and it provides processors with a dependable, year-round supply of products. Augmenting the wild fishery, aquaculture generates new employment opportunities in production, processing and the many supplies and services ventures that support the sector.

The Department of Fisheries and Oceans, the lead federal agency for aquaculture, notes that *“Canada has enormous potential to be a world aquaculture leader. Strengths include extensive coastlines and productive marine and freshwater resources, a reputation for quality products, proximity to established and growing markets, an effective and efficient transportation infrastructure, an internationally reputable food inspection system, a skilled workforce and strong management expertise. However, obstacles, such as a cumbersome regulatory framework and trade barriers, keep Canada from realizing its potential”*².

With encouragement from the Ontario Minister of Natural Resources, the Northern Ontario Aquaculture Association has championed this 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.

¹ The United Nations Food & Agriculture Organization (FAO) projected that the proportion of world seafood derived from aquaculture would reach 50% by 2030; in fact, this level of output was attained earlier this decade. See, Brugère, C. & N. Ridler (2004). Global Aquaculture Outlook in the Next Decades: An Analysis of National Aquaculture Production Forecasts to 2030.

² DFO Strategic Plan 2005-10

INDUSTRY STATUS & OUTLOOK

Aquaculture in Canada

Canadian aquaculture output increased at an average annual rate of nearly 18% between 1986 and 2006, when total production reached 171,829 tonnes valued at \$912 million. The industry is dominated by four species: salmon (69%), blue mussels (14%), oysters (7%) and trout (3%).

Freshwater aquaculture in Canada accounts for approximately 8,400 tonnes of product having a farm-gate value of \$44 million with salmonid species representing more than 91% of the production tonnage and 89% of the value. Ontario is the dominant producer in the freshwater aquaculture sector (46.8%), followed by Quebec (17.5%), Saskatchewan (14.6%), Alberta (7.5%), New Brunswick (7.1%), British Columbia (3.2%), Yukon Territory (1.4%), Prince Edward Island (1.4%) and Nova Scotia (0.3%)³.

Aquaculture in Ontario

At approximately 4,500 tonnes per year, aquaculture in Ontario is modest. Rainbow trout is the principal species produced, accounting for more than 97% of output. Minor species include tilapia, Arctic charr, brook trout, smallmouth and largemouth bass, walleye and cyprinid baitfish. These minor species represent only about 100 tonnes of annual production and, therefore, remain more developmental than commercial. In comparison to Ontario, France, Italy, Germany, Britain and Denmark produce more than 170,000 tonnes of trout in freshwater systems. Clearly, Ontario's output is not commensurate with the inherent potential of the province.

Most aquaculture operations are clustered in Central and Southern Ontario (Figure 1), where the availability of high quality water (ground and surface water supplies), suitable climate conditions, and a developed infrastructure for goods and services present conditions favourable to sector development. Today, cage culture operations represent about ¾ of total production capacity.

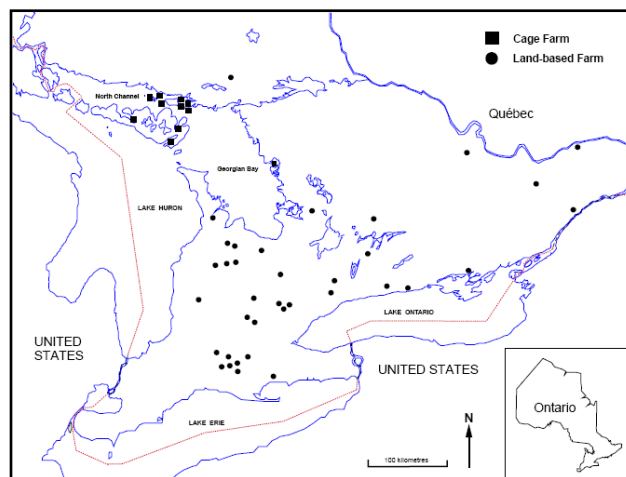


Figure 1: Distribution of land-based and cage aquaculture operations in Ontario⁴.

The total farm gate value associated with land-based and cage aquaculture production in 2005 was approximately \$18 million from about 112 operations (104 land-based and 8 cage culture sites)³. Rainbow trout accounted for \$15.5 million of this total while the minor species generated about \$1 million. Production for pond stocking was conservatively estimated at \$1.5 million⁴.

³ Stechey, D., L. Albright, D. Foss, E. Gilbert, S. Lareau, J. Maheu, M. McNaughton, M. Meeker, and W.D. Robertson (2008). Status and Outlook for Freshwater Aquaculture in Canada: Regional Perspectives. Proc. 2007 Meeting of the Aquaculture Association of Canada (in press).

⁴ Moccia, R. D. and D. J. Bevan (2007). Aquastats 2005 – Ontario Aquacultural Production in 2005. University of Guelph, Aquaculture Extension Centre Factsheet, No. 07-001.

When aquaculture supplies and service providers are factored in (e.g. feed, fingerlings, processing, etc.), the value of the sector exceeds \$51 million annually. More than 225 people are employed directly within the sector. A 2007 study determined that the Ontario aquaculture sector has an employment multiplier of 4.5 and a sales expenditure multiplier of 4, suggesting that the sector supports additional employment and economic activity in the wider economy⁵.

The location of the employment opportunities is even more significant. Aquaculture exists principally in rural communities, many of which have suffered due to the demise of traditional fisheries and forestry and the loss of family farms, and where opportunities for sustainable economic development can be elusive. Aquaculture succeeds in areas where other industries have difficulty taking root and remaining competitive.

Building upon a solid foundation established by individual entrepreneurs and small and medium-sized businesses, the sector has a tremendous capacity to expand and diversify. In spite of its inherent potential, however, there has been no growth in the industry for more than a decade (Figure 2). Further development of the sector has been forestalled by regulatory agencies' and some environmental stakeholders' concerns about environmental (water quality, benthic sediments) and social / land-use issues.

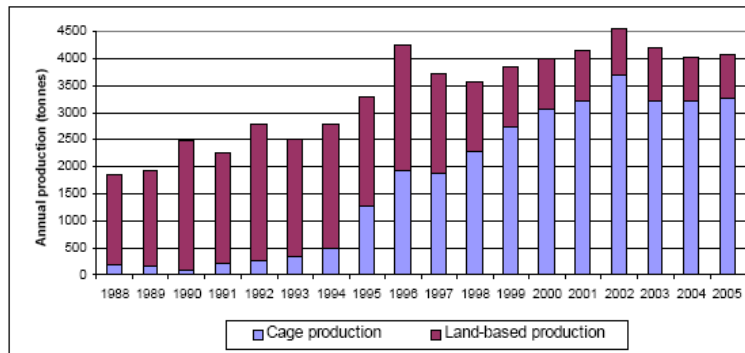


Figure 2: Annual production of rainbow trout in Ontario from land-based and cage culture operations from 1988-2005⁴

Toward Sustainable Aquaculture Development

In Ontario's drive to become a leading supplier of rainbow trout (and other species), producers are aware of the broader objectives of society – to bring economic development to Ontario's Great Lakes and rural regions in harmony with the social fabric of these communities, while preserving environmental integrity and the culture and traditions of Aboriginal peoples. That is, the sector must be built around the three fundamental factors for responsible sustainable development; namely:

- economic prosperity; → Responsible Industry Development
- environmental protection; and → Healthy Ecosystems
- social well-being → Social Licence⁶.

⁵ Harry Cummings & Associates (2007). Economic Impact of the Cage Culture Industry in Ontario. 51 p.

⁶ 'Social licence', a term coined in the mining sector, is intended to reduce user-group conflict in natural resource sectors. It is based on the concept that utilization of natural resources for commercial interests requires free, prior, and informed consent from communities affected by the proposed development through mutual understandings and agreements, leading to the affected community's broad support for the project. That is, local stakeholders and other vested interests must be

Authentic sustainable development necessitates that all three factors be reflected equitably since initiatives built on only one or two of the factors cannot and will not deliver the benefits associated with sustainable development.

Moccia and Bevan⁴ suggest that “*The aquaculture industry in Ontario is facing a very difficult and volatile future. This situation is mostly a result of internal factors that constrain its growth, rather than foreign competition, effectively limiting more successful market penetration, and thus reducing profitability and discouraging new investment. [Currently], the Ontario industry is languishing in one of its worst periods in the last decade. The major constraint to Ontario’s aquacultural development remains the complex and confusing legislative, regulatory and policy barriers that confront cage aquaculture expansion in the public waters of the Great Lakes, where 80% of Ontario’s market size fish production occurs.*”

Successful and sustainable aquaculture development in Ontario will require a new era of co-operation and collaboration amongst industry, governments, First Nations and local communities, and a determination to address and resolve challenges pertaining to the interests of all parties. Expansion within the freshwater aquaculture sector, therefore, is dependent upon development and implementation of a strategic approach to generate the knowledge, technologies and practices necessary to resolve these constraints.

Competitive Advantages of Ontario Aquaculture

A range of biophysical, technological and demographic factors suggest that aquaculture in Ontario has every opportunity to compete and succeed, owing to the following competitive advantages:

- A biophysical resource base well suited for the production of trout (i.e. water supplies, production sites, etc.);
- Potential to increase exports to the U.S., which is increasingly dependent on imported seafood and where the market for trout is supply-limited;
- A considerable potential and need for agricultural diversification and latent infrastructure to support development;
- Favourable currency exchange rates (Cdn \$1.15 = US \$1.00 through 2010 and beyond);
- Leading freshwater aquaculture R&D capacity, namely at the University of Guelph, Fisheries and Oceans Canada’s Experimental Lakes Area, Environment Canada’s Canadian Centre for Inland Waters;
- Established infrastructure for transportation, communication, low-cost energy, etc.;
- An available skilled and trainable labour pool; and
- Knowledgeable and experienced aquaculture management with a desire to support sustainable development and expand operations.

meaningfully engaged to identify their values and beliefs and to identify appropriate measures to mitigate effects of the project. (Sources: Salim, E. (2004). Striking a Better Balance: The World Bank Group and Extractive Industries: The Final Report of the Extractive Industries Review. 44 p.; Shepard, R.B. (2008). Gaining a Social License to Mine. MINING.com April 2008, p. 20-23.)

VISION & VALUES

Vision Statement

“The Ontario aquaculture sector generates wealth and knowledge using aquatic resources for production of safe, quality foods. The industry is committed to earning and upholding public confidence as a recognized source of sustainable economic development by employing innovative research and best management technologies and practices. Operating within an enabling and comprehensive regulatory framework, aquaculture will advance in a responsible manner that is respectful of local communities and the environment.”

Values

- *Environmentally Responsible / Environmentally Accountable*
 - We will ensure the respectful utilization of common resources
- *Rural Economic Development*
 - We promote economic development and wealth generation in our rural communities
- *Product Quality & Safety*
 - We are committed to the production of safe, quality foods
- *Respect for Others*
 - We demonstrate respect for our communities and our environment by adhering to robust *Best Management Practices for Sustainable Aquaculture in Ontario*
- *Integrity*
 - We are committed to the highest standards of honesty and ethical conduct
- *Research & Objectivity*
 - We proudly support scientific research and the objective communication of unbiased information

STRATEGIC OBJECTIVES

It is recognized that Ontario has considerable potential for aquaculture development. It is also apparent, however, that future aquaculture development is contingent upon first addressing matters pertaining to the real and perceived environmental effects of aquaculture operations and the effectiveness of aquaculture governance. Therefore, realization of Ontario's inherent potential as a responsible aquaculture producer requires that measures be taken to enhance public and investor confidence in the abilities of industry and governments to manage aquaculture efficiently and sustainably.

Implementation of this Strategy for Sustainable Aquaculture Development in Ontario is intended to promote advances in the environmental, social and economic sustainability of rainbow trout aquaculture, stimulate capital investment in the sector, and foster regional economic development by generating meaningful employment in this renewable agri-food sector. The following strategic outcomes are targeted within this strategy.

Enabling Responsible Development	Upholding Public Confidence	Maintaining Healthy Ecosystems
<ul style="list-style-type: none"> • Sectoral growth; regional economic development • Increased investment • Improved technologies & practices for sustainable development • Effective, efficient & transparent policy & regulatory framework 	<ul style="list-style-type: none"> • Enhanced stakeholder & community engagement • Communication of objective information regarding aquaculture • Effective, efficient & transparent policy & regulatory framework 	<ul style="list-style-type: none"> • Improved understanding of environmental effects • Best Management Practices validated by an independent audit function • Demonstration of innovative technologies and practices for sustainable development • Effective, efficient & transparent policy & regulatory framework

Objective 1: Enabling Responsible Development

The Ontario trout sector is well-positioned to increase its production capacity and displace imports of South American trout in domestic and U.S. markets. Within 10 years, it is envisaged that total output of rainbow trout in Ontario will double, to approximately 9,000 tonnes annually, generating total annual revenue in excess of \$100 million. In doing so, the sector will become more productive, benefiting from investment into enhanced technologies and achieving economies of scale.

This growth strategy will depend, in part, on continued industry and government investment into R&D to develop and demonstrate innovative technologies and practices that will improve productivity and sustainability, and subsequently, to widespread implementation of best technologies and practices. It is essential for industry to commit to measures that will promote continuous improvement in their operations. By stimulating efficiency and profitability, and by fostering socially and environmentally sustainable production techniques as a key competitive advantage, such technologies are expected to attract new investment to the sector.

Today, consumer and environmental groups (ENGOS) are successfully encouraging restaurants and food retailers to purchase seafood from only those sources that are recognized to be sustainable. Consequently, buyers are increasingly seeking to assure their customers that they purchase from certified producers. Promotion of certified Ontario trout for Ontario tables will be a central theme in sector development.

Development of an Ontario rainbow trout broodstock program to improve the key characteristics of rainbow trout for cage culture production is also central to sector competitiveness and will reduce reliance on imported ova.

Objective 2: Upholding Public Confidence

Due to the over-exploitation and collapse of many fisheries, and questions about the effects of some forms of aquaculture, social and environmental sustainability has become an essential requirement for success in the seafood sector. Aquaculture production and processing operations must be consistent with the broadly held social and environmental values shared by all stakeholders. Responsibility and accountability are essential to continued aquaculture development.

Looking ahead, community interests (i.e. environmental sustainability, social fabric, economic prosperity, and government roles/support) must become more broadly factored into key planning initiatives. Community engagement to involve parties with a direct interest in regional development in the problem-solving and decision-making activities is recognized as being important to sustainable aquaculture development.

More reliable and more timely dissemination of objective information regarding the scope and status of aquaculture development is essential to informed decision-making, necessitating more proactive communications from industry and governments.

Objective 3: Maintaining Healthy Ecosystems

It is envisaged that environmental sustainability will become a differentiating benefit that will generate a competitive advantage for Ontario aquaculture producers. The key challenge is to establish clear environmental objectives, standards and sustainable practices, and to demonstrate adherence to the standards and practices.

To help achieve this objective, an efficient and effective federal-provincial policy and regulatory framework governing aquaculture in Ontario is essential. Regulatory processes must become streamlined to enable management of important environmental interactions, and more harmonized to reduce duplication and costs. Site applications and approvals processes incorporating class-type assessment techniques, and which are bound by appropriate service standards, would serve to enhance stakeholder and investor confidence in the sector.

An environmental monitoring and reporting program that compiles and presents environmental effects data which can be applied toward adaptive operational management of aquaculture sites will enable industry and governments to be jointly accountable for adherence to sustainable practices.

Strategic Action Items

The following strategic action items have been identified as fundamental initiatives that need to be addressed to advance sustainable aquaculture development in Ontario.

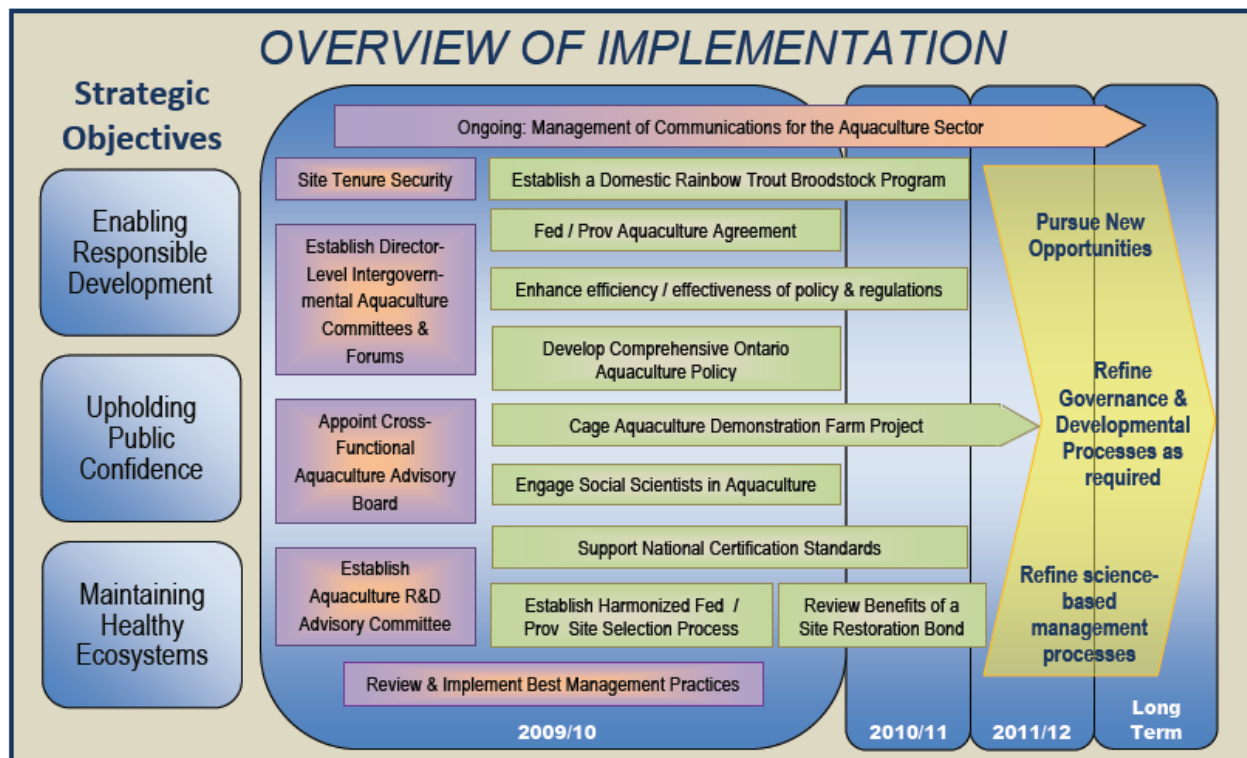
1. Establish intergovernmental and government / industry committees and forums to advance sustainable aquaculture in Ontario
2. Establish an Ontario Aquaculture Advisory Board (OAAB)
3. Establish an Ontario Aquaculture Research & Development Advisory Committee
4. Improve security of tenure for aquaculture operators.
5. Establish a comprehensive Ontario Aquaculture Policy rooted in the principles of science-based resource stewardship and adaptive management.
6. Develop a harmonized and streamlined site selection and application process based on sound science and with appropriate service standards.
7. Enhance the efficiency and effectiveness of operational policy and regulation governing aquaculture.
8. Review and implement the 'Best Management Practices for Sustainable Aquaculture in Ontario' developed in 2006 for the NOAA.
9. Implement a domestic rainbow trout broodstock program.
10. Support development of a National Aquaculture Certification Standard.
11. Develop and implement a Communications Strategy for Ontario aquaculture.
12. Explore the benefits of a Site Restoration (Bond) Fund to safeguard site remediation.
13. Engage social scientists to conduct research and development pertaining to the socio-economic aspects of aquaculture development.
14. Establish a Cage Aquaculture Demonstration Farm project to develop and evaluate innovative technologies and practices designed to enhance the social and environmental sustainability of the sector (e.g. fallowing, solid waste management, etc.).

IMPLEMENTATION

Every process has a strategy even if it is not formally articulated. Good strategy is built upon a foundation of comprehensive basic analyses and sound strategic principles, and it is responsive to the patterns of change occurring in the life cycle of the project. Formulating a strategy is the art of creating value by linking knowledge and competencies to pursue opportunities. Successful strategies are widely understood and communicated – before they are implemented.

Successful implementation of this strategy will require a dedicated and determined effort by all parties associated with aquaculture development and management in the province. Armed with the knowledge of lessons learned in the past, Ontario aquaculture is positioned to flourish, provided all stakeholders are willing and able to consider alternative strategies and regulatory protocols. This Strategy marks a turning point for the sector – a time to embrace change in the interest of advancing sustainable aquaculture development for the benefit of all Ontarians.

The *Action Plan for Sustainable Aquaculture Development in Ontario* outlines the principal strategic actions to be undertaken in fulfilment of the strategic objectives set out above. The principal strategic action items, identifying ‘what needs to be addressed’ are outlined in the following chart. Some of these initiatives will occur concurrently whereas others will unfold in subsequent stages of implementation.



Structural Initiatives

Successful implementation of any strategy necessitates establishment of a guiding coalition that will undertake a coordinating role in the implementation process. The coalition will, in effect, oversee implementation of the Strategy. It is important that the members of the coalition be empowered to act on behalf of their organizations and that, collectively, the team has the credibility and expertise to make informed, progressive decisions. The coalition members must have the leadership skills to drive the requisite change outlined in the Strategy.

Industry and governments are implicated in the initiatives outlined in this strategic plan. Therefore, to advance efficiency, effectiveness and transparency, it is recommended that two 'coordinating bodies' be established to address matters pertaining specifically to sustainable aquaculture development. One would be comprised of federal and provincial agencies having regulatory and/or developmental responsibilities. The other would consist of aquaculture producers, suppliers and other stakeholders. Represented by diverse interests, and working cooperatively, these two coordination bodies would provide the necessary guiding coalition.

1. Establish intergovernmental and government / industry committees and forums to advance sustainable aquaculture in Ontario

Under the leadership of the Ontario Ministry of Natural Resources (with the support of OMAFRA, MNDMF, MOE) and Fisheries and Oceans, Ontario and Canada are negotiating a Subsidiary Agreement on Aquaculture Development under the existing Canada-Ontario Fisheries Agreement (COFA). Similar to the federal-provincial Memoranda of Understanding on Aquaculture Development in other provinces, it is envisaged that the Agreement will require a committee structure to guide implementation. The Ontario aquaculture sector supports the establishment of a Canada / Ontario agreement to delineate federal and provincial roles and responsibilities pertaining to aquaculture development and management in the province.

2. Establish an Ontario Aquaculture Advisory Board (OAAB)

It is recommended that an Ontario Aquaculture Advisory Board with cross-functional representation to be established to work with the parties to the Canada-Ontario Subsidiary Agreement on Aquaculture Development to coordinate implementation of the *Strategy for Sustainable Aquaculture Development in Ontario*. It is envisaged that the Board will have representation from a diverse group of industry and community interests, such as:

- Aquaculture Producers
 - NOAA (2 seats) (Chair)
 - Fingerling Suppliers (1 seat)
 - Goods and Services Suppliers (1 seat)
- Regional Communities
 - Regional municipalities (1 seat)
 - Regional interest groups (1 seat)
- Aboriginals
 - First Nations (1 seat)
 - Aboriginal organizations (1 seat)

Working collaboratively, the OAAB and the parties to the Canada-Ontario Subsidiary Agreement on Aquaculture Development would establish priorities and oversee implementation of the *Strategy for Sustainable Aquaculture Development in Ontario* and the associated *Action Plan*.

3. Establish an Ontario Aquaculture Research & Development Advisory Committee

Scientific research is the foundation of knowledge, competitiveness and sustainability in aquaculture. Therefore, strategic investment into research and development is critical to the generation of new technologies and practices, and to the on-going sustainable development of aquaculture in Ontario. A coordinating mechanism is required to identify R&D priorities and to champion the research necessary to lead change and continuous improvement in the sector.

The Ontario Sustainable Aquaculture Working Group (OSAWG) was established in 1999 by Environment Canada's Environmental Protection Branch - Ontario Region as an *ad hoc* inter-agency, industry-government group to respond to growing public concerns about the effects of aquaculture on water quality and fish habitat. It is recommended that this Group be formally re-established as a collaborative, multi-stakeholder body responsible for identification and prioritization of R&D pertaining to sustainable aquaculture development in the province. Mechanisms to disseminate knowledge and facilitate its transformation into real gains in productivity and sustainability should be included within the mandate.

Policy & Regulatory Initiatives

4. Improve security of tenure for aquaculture operators.
5. Establish a comprehensive Ontario Aquaculture Policy rooted in the principles of science-based resource stewardship and adaptive management.
6. Develop a harmonized and streamlined site selection and application process based on sound science and with appropriate service standards.
7. Enhance the efficiency and effectiveness of operational policy and regulation governing aquaculture.

Operational Initiatives

8. Review and implement the 'Best Management Practices for Sustainable Aquaculture in Ontario' developed in 2006 for the NOAA.
9. Implement a domestic rainbow trout broodstock program.

Social Licence Initiatives

10. Support development of a National Aquaculture Certification Standard.
11. Develop and implement a Communications Strategy for Ontario aquaculture.
12. Explore the benefits of a Site Restoration (Bond) Fund to safeguard site remediation.
13. Engage social scientists to conduct research and development pertaining to the socio-economic aspects of aquaculture development.
14. Establish a Cage Aquaculture Demonstration Farm project to develop and evaluate innovative technologies and practices designed to enhance the social and environmental sustainability of the sector (e.g. fallowing, solid waste management, etc.).

Acronyms

Provincial Government

MAFRA	Ministry of Agriculture, Food and Rural Affairs
MOE	Ministry of the Environment
MNR	Ministry of Natural Resources
MNDMF	Ministry of Northern Development, Mines & Forestry

Federal Government

AAFC	Agriculture & Agri-Food Canada
CCG	Canadian Coast Guard
CFIA	Canadian Food Inspection Agency
DFO	Fisheries & Oceans Canada
EC	Environment Canada
FedNor	Federal Development Agency for Northern Ontario

Industry

NOAA	Northern Ontario Aquaculture Association
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Other

ENGO	Environmental Non-Government Organization
UoG	University of Guelph

ACTION PLAN RECOMMENDATIONS FOR SUSTAINABLE AQUACULTURE DEVELOPMENT IN ONTARIO

Item	Strategic Objective / Action	Contributors	Targeted Outcomes
Structural Initiatives			
1.	Governments of Ontario and Canada to establish intergovernmental and government / industry committees and forums to advance sustainable aquaculture in Ontario.	MNR; DFO	a) MNR and DFO are to finalize discussions and implement an Ontario-Canada Subsidiary Agreement on Aquaculture Development to delineate roles and responsibilities pertaining to aquaculture development and management.
2.	Industry to establish an Ontario Aquaculture Advisory Board with cross-functional representation to work with inter-governmental committees to coordinate implementation of the Strategy for Sustainable Aquaculture in Ontario.	NOAA; MNR; DFO	a) NOAA to organize a pre-meeting to discuss development of a formal governance structure and by-laws for the OAAB, outlining <ul style="list-style-type: none"> - Board composition, membership duration, eligibility; - Quorum; - Voting protocol; - Committees; - Meeting schedule; etc. b) Solicit legal counsel to establish the OAAB
3.	Ontario Sustainable Aquaculture Working Group (OSAWG) to lead an exercise to formalize transition of the <i>ad hoc</i> group into the Ontario Aquaculture R&D Advisory Committee with equitable representation from all pertinent governments and stakeholders.	EC; UoG; DFO; MNR; MOE; MAFRA; MNDMF; FedNor; NOAA	a) OSAWG members to coordinate a meeting of interested parties to establish the Ontario Aquaculture R&D Advisory Committee and to discuss a formal governance structure and by-laws for the Committee, outlining <ul style="list-style-type: none"> - Membership, - Voting protocol; - Sub-committees; - Meeting schedule; etc.
Policy & Regulatory Initiatives			
4.	MNR to provide improved security of tenure for aquaculture operators.	MNR; NOAA	a) Implement aquaculture leasing and licensing systems with 20-year terms and 5-year renewal / remediation clauses.
5.	Province of Ontario to establish a comprehensive Ontario Aquaculture Policy rooted in the principles of science-based resource stewardship and adaptive management.	MNR; MOE; MAFRA; MNDMF	Policy objectives should include: <ol style="list-style-type: none"> a) acknowledgement of cage aquaculture as a legitimate user of public aquatic resources; b) performance monitoring and reporting requirements to support improved decision-making and adaptive management; c) a process for meaningful Aboriginal and public engagement; d) a permanent intergovernmental aquaculture committee to coordinate the review of all lease, permit and licence applications; e) appropriate service standards for lease, permit and licence applications and reviews

6.	Governments of Ontario and Canada to develop a harmonized and streamlined site selection and application process based on sound science and with appropriate service standards.	DFO; EC; CCG; MNR; MOE; MNDMF; MAFRA; NOAA; UoG	<p>a) As lead agencies, DFO and MNR to engage all pertinent provincial and federal agencies in a process to develop an effective site selection and review protocol for cage aquaculture in Ontario that incorporates alternative nutrient management technologies (e.g. feed quotas / formulation, following, etc.)</p> <p>b) Develop a resource-use geographical information system (mapping) tool to facilitate the identification of suitable areas for aquaculture development.</p> <ul style="list-style-type: none"> - Review the utility of the draft mapping tool developed by DFO - Develop the tool into an effective site selection decision tool. - Utilize the tool to facilitate the identification of potential sites for a cage aquaculture demonstration farm that will be used to validate the amended site review and selection process <p>c) Develop a class-type environmental assessment process for site applications and environmental reviews</p>
7.	Ontario to enhance the efficiency and effectiveness of operational policy and regulation governing aquaculture.	MNR; NOAA MOE; NOAA	<p>a) Develop a fair Appeal Process for dispute resolution.</p> <p>b) Review the benefits associated with waiving fees to amend Certificates of Approval to improve effluent treatment works at land-based aquaculture operations</p>
Operational Initiatives			
8.	Industry to review and implement the 'Best Management Practices for Sustainable Aquaculture in Ontario' developed in 2006 for the NOAA.	Industry producers; NOAA Industry producers; NOAA; MAFRA	<p>a) Review 'Best Management Practices for Sustainable Aquaculture in Ontario' (2006) and accompanying Standard Operating Procedures to validate thoroughness and relevance in 2009; update as necessary.</p> <p>b) Develop 3rd Party audit management system.</p> <p>c) Identify & appoint auditor.</p> <p>d) Develop a benchmarking system to be incorporated into the BMPs / SOPs that will promote continuous improvement in the productivity and sustainability of operations.</p>
9.	Industry and the research community to implement a domestic rainbow trout broodstock program.	Industry producers Industry producers; NOAA; MAFRA; DFO; FedNor; UoG	<p>a) Identify genetic traits to be targeted in a rainbow trout broodstock selection program.</p> <p>b) Support the initiative to establish a domestic Rainbow Trout Broodstock Program based at the Alma Aquaculture Research Station</p>

Social Licence Initiatives			
10.	Industry and DFO to support development of a National Aquaculture Certification Standard.	Industry producers; NOAA; DFO; CFIA; MAFRA NOAA Industry producers; NOAA	a) Identify issues pertinent to the Ontario aquaculture sector to be reflected in a National Aquaculture Certification Standard b) Encourage the Canadian Aquaculture Industry Alliance to lobby Fisheries & Oceans Canada and the Canadian Food Inspection Agency to develop and implement a National Aquaculture Certification Standard c) NOAA and its members to participate actively in the development of the Standard.
11.	Industry to develop and implement a Communications Strategy for Ontario aquaculture.	NOAA; industry producers; U-G NOAA Industry producers; NOAA NOAA	a) Prepare a Request for Proposals to develop a comprehensive Communications Strategy for Ontario Aquaculture b) Identify resources to implement a Communications Strategy, including a preliminary public opinion survey to gauge level of awareness and areas of interest c) Develop and implement a communications tool to demonstrate industry's adherence to environmental monitoring and reporting requirements in a transparent manner. d) Develop a Community Engagement Plan to engage pertinent local community groups and First Nations in key aquaculture proposals, decisions and developments.
12.	Explore the benefits of a Site Restoration (Bond) Fund to safeguard site remediation.	NOAA; MNR; DFO; FedNor	a) Prepare a business case to establish a Site Restoration (Bond) Fund based on experiences in other aquaculture sectors
13.	Engage social scientists to conduct research and development pertaining to the socio-economic aspects of aquaculture development.	NOAA; UoG NOAA NOAA; UoG NOAA; UoG; DFO; MNR; MAFRA; MNDMF NOAA	a) Develop Terms of Reference for Preparation of a white paper on socio-economic issues in aquaculture development b) Identify resources and issue a contract for preparation of the white paper c) Prepare an outline for a 1-day workshop to review socio-economic issues pertaining to aquaculture in Ontario d) Identify social science researchers at ON universities who may have an interest in studying community and resource utilization issues associated with aquaculture e) Organize and facilitate a 1-day workshop to review socio-economic issues pertaining to aquaculture in Ontario and invite identified researchers to participate.

14.	Industry and government to pursue establishment of a Cage Aquaculture Demonstration Farm project to develop and evaluate innovative technologies and practices designed to enhance the social and environmental sustainability of the sector (e.g. fallowing, solid waste management, etc.).	Industry producers; NOAA; MOE; MNR; MAFRA; MNM; DFO; EC; FedNor; UoG	a) Support on-going efforts to develop a comprehensive plan to establish a Cage Aquaculture Demonstration Farm for production of trout to validate and demonstrate alternative technologies and practices to BATEA ⁷ standards, including: <ul style="list-style-type: none"> - nutrient management strategies; - solid waste management; - waste mitigation (e.g. fallowing); - feeding strategies; etc.
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⁷ Best Available Technology Economically Achievable (BATEA)