
BEST MANAGEMENT PRACTICES FOR SUSTAINABLE AQUACULTURE IN ONTARIO

Aquaculture, the farming of aquatic animals, is a viable and legitimate sub-sector of Ontario's agriculture industry that produces fish for human consumption and stock enhancement, generating substantial employment and economic prosperity in rural and coastal communities throughout the province. As an industry that is dependent upon healthy and productive aquatic resources, aquaculturists are eminently aware of the need to utilize this resource wisely and not to compromise its quality or availability for their own productivity or for the use and enjoyment of others. Since commercial aquaculture began in Ontario during the 1950s, environmental sustainability and accountability have been fundamental to the industry's success and social licence. Water quality conditions have been upheld, there have been no detrimental impacts from escaped fish and scientific evaluations have documented direct benefits to feral fisheries populations due to aquaculture development. Moreover, the sector has taken a pro-active approach to continually improve environmental sustainability and resource stewardship.

Three inter-related protocols provide the basis for environmental management and regulation of aquaculture:

1. International agreements on environmental protection and sustainability by which Canada is bound (e.g. The U.N. Food and Agriculture Organization's Code of Conduct for Sustainable Aquaculture);
2. National and provincial environmental laws and regulations (e.g. *Fisheries Act* of Canada, *Ontario Water Resources Act*, *Fish and Wildlife Conservation Act*, etc.); and
3. Codes of Conduct and/or Best Management Practices at the farm and producer association level.

The Northern Ontario Aquaculture Association (NOAA) has developed these **Best Management Practices for Sustainable Aquaculture in Ontario** (hereinafter the BMPs) to demonstrate that operations are being conducted in full compliance with regulatory requirements and that the sector is working proactively to ensure environmental sustainability. The BMPs relate to all aspects of fish farm design, operation, management, record keeping, environmental monitoring / reporting and include rapid response plans for emergencies. They consist of mandatory principles and practices which demonstrate a high level of commitment and diligence in the operation of aquaculture facilities and reflect the commitment made by all producers to environmental stewardship and product quality assurance. Over time, as new knowledge, research results and farm management practices emerge, the BMPs will evolve to remain current with state-of-the-art technologies and practices in an environment of continuous improvement.

It is the responsibility of all aquaculturists to ensure that aquaculture development in Ontario is environmentally responsible and accountable. Compliance with the BMPs will assure that this responsibility is upheld. All members of the Ontario aquaculture industry are required to implement the BMPs at all operating farm sites. Implementation of the BMPs begins with educating and training producers about the goals and benefits of the initiative. Incentives have been included to facilitate implementation while appropriate sanctions are imposed for those producers found to be non-compliant. Monitoring and reporting of BMP implementation is designed to address the needs and concerns of operators, regulatory authorities, the scientific community and the general public.

1. Guiding Principles

All aquaculturists will:

- Be responsible to the fish, the environment, the consumer and the communities within which they operate.
- Conduct operations in compliance with the legislation governing aquaculture.
- Support practical strategies for responsible aquaculture development to ensure that environmental performance standards are monitored and met.
- Promote appropriate incentives for responsible environmental performance and advocate sanctions for non-compliance.
- Utilize science-based adaptive management¹ to foster continuous improvement.
- Recognize that aquaculture is a sophisticated food production system and at every step of the farm process provide adequate consideration for consumer health, safety and enjoyment of the product.
- Give due consideration to the health and safety of those employed in the industry as well as visitors to farm sites.
- Refrain from rearing genetically modified organisms until such time that the technology is proved to be safe for the environment and the product is safe and accepted for human consumption. No genetically modified fish are currently approved for culture in Canada.
- Coordinate and collaborate with national, regional, and local governments in the development and implementation of policies, regulations, and procedures to achieve environmental, economic, and social sustainability of aquaculture operations.
- Cooperate with others in the industry in research, technological and educational activities intended to improve the sustainable development of aquaculture.
- Strive to improve local economies and community life through economic diversification, generation of meaningful employment, contribution to the tax base and infrastructure and demonstrate respect toward other users of the resource base.
- Commit to operational transparency and product traceability.
- Ensure that all employees are competent to meet the goals of the BMP and relevant government regulations in accordance with their job description.

¹ Adaptive management enables periodic amendment on the basis of information collected during monitoring and advances in science and technology.

2. Legislation & Regulations

These BMPs are to be applied by industry to supplement and complement regulatory requirements. They are intended to ensure that the industry remains environmentally responsible and accountable. Serving as guidelines, the BMPs direct farmers in the development of specific operational practices and procedures that address the specific aspects of their individual farms. They contribute to a system of '*smart regulation*' which recognizes and utilizes a variety of conventional (regulatory) and less-conventional (self-regulatory) mechanisms to enhance environmental responsibility, leading to improved performance in the sector. Therefore,

All aquaculturists will:

- Abide by all applicable legislation and regulations (see Appendix I), recognizing that all industries are dependent upon an effective legal framework for their growth and development.
- Consult and collaborate with national and regional authorities regarding the development and implementation of policies, practices and regulations concerning the environmental, economic and social sustainability of aquaculture.
- Interpret and apply BMPs so as not to prejudice the rights, jurisdiction, and duties of Ontario or Canada under international law, convention, or agreement to which they are a signatory (should discrepancy arise between the BMP and government regulation, the latter shall take precedence).

3. Integrating with the Environment

The productivity and the social and economic sustainability of aquaculture are inherently dependent upon maintaining a healthy and productive aquatic environment. Therefore,

All aquaculturists will:

- Plan and operate aquaculture sites that are safe, sustainable and environmentally responsible and accountable.
- Design and operate aquaculture ventures to utilize water resources responsibly.
- Prepare a baseline environmental study for each site prior to beginning operations.
- Routinely monitor and record near-field and far-field environmental effects of aquaculture operations in accordance with Standard Operating Procedures and with regulated monitoring requirements.
- Routinely communicate the results of near-field and far-field environmental monitoring openly and transparently as prescribed in the Standard Operating Procedures.
- Work to continuously enhance the environmental sustainability of operations.
- Upon termination of operations at all or part of a facility, prepare a decommissioning plan for review and approval by the responsible authority. Remove all works and gear from the waterway and conduct any ordered restoration.
- Certify and register compliance with these BMPs by endorsing the Environmental Policy Statement and submitting copies to the home office of the NOAA and posting a copy at each operating site.

4. Site Selection

The productivity of aquaculture operations is dependent upon healthy and productive environmental resources. For example, with the exception of site selection, cage culture operators have little ability to control the environmental conditions their fish are exposed to. Sustainable development also necessitates that the receiving environment be capable of assimilating the organic by-products associated with aquaculture operations. Consequently, proper site selection factors and guidelines are essential to successful development. Therefore,

All aquaculturists will:

- Recognize the importance of good site selection, system design and infrastructure to minimize ecosystem changes.
- Conduct a comprehensive site assessment as part of the application process to characterize the habitat, ecosystem and hydrographical conditions at the site, and project the environmental carrying capacity of the site.
- Operate where healthy farmed aquatic organisms can be economically produced with acceptable environmental effects; systems will not be sited where the discharge may impair protected water resources, at-risk water bodies, and special habitats.
- Aquaculture ponds should not be sited in areas prone to flooding to reduce the long-term effects associated with potential escapement of farmed fish and erosion.

5. Facilities Design and Infrastructure

Effective design and management of production facilities is fundamental to productivity and sustainability. Therefore,

All aquaculturists will:

- Design, develop and manage farms such that resources are used efficiently and within the projected carrying capacity of the site.
- Ensure that the equipment used at their facilities is designed, constructed, installed, and maintained to meet accepted standards.
- Maintain an orderly site, foreshore and backshore.
- Implement access control for movement of vehicles and personnel at production facilities, where practicable – as in upland / shore-based facilities.
- Develop routine maintenance programs to ensure that the equipment is maintained in a manner that assures operational, farm stock and environmental integrity in accordance with Standard Operating Procedures.
- Develop written policies and procedures for monitoring, evaluating core infrastructure and maintain records of monitoring, repairs and maintenance.

For land-based operations, all aquaculturists will:

- Utilize technologies designed to rapidly and continuously isolate solid wastes from process waters.
- Utilize systems that conserve water resources.
- Utilize energy-efficient technologies.

For cage culture operations, all aquaculturists will:

- Ensure that cage and mooring systems are designed to withstand the conditions expected at the site.
- Utilize nets that are designed, constructed, installed, and maintained to acceptable standards for conditions at the site; all nets should be UV-protected.
- Conduct daily, monthly and semi-annual surface and sub-surface inspections of all cages and mooring system components as outlined in the Standard Operating Procedures and maintain written records for all inspections and related repairs and maintenance.
- Conduct post-storm inspections of all structures following winds greater than 55 knots.
- Adjust mooring systems as necessary to maintain rigging tension to installation standards.
- Comply with Canada Coast Guard navigational guidelines for marking cage sites.

6. Fish Containment

Farmed fish are valuable private property and it is in the best economic interest of aquaculturists to keep all stocks securely contained within the culture system. Moreover, in certain circumstances, escaped fish may pose an ecological risk to feral fisheries resources in surrounding waters. Therefore,

All aquaculturists will:

- Develop and implement systematic loss-control plans that include a site-specific analysis of the potential risks of escapes, their likely causes (e.g. equipment failure, operational errors, predation) and the specific procedures employed by the farm to reduce the risk by employing technologies to effectively contain fish within the rearing units.
- Conduct routine inspection and maintenance of farm facilities to secure the livestock and prevent losses.
- Take additional precautions during grading, sorting and harvesting.
- Maintain a list of emergency contacts and procedures for reporting significant escapes and, in the event of an escape, co-operate and inform the respective authorities to assure that appropriate action(s) will be taken.
- Develop appropriate contingency plans to deal with unplanned releases of farmed fish.
- Routinely monitor fish inventory.
- Provide training to employees and contractors regarding escape prevention.

For land-based operations, all aquaculture will:

- Evaluate all facilities and operations with regard to fish containment in accordance with the Standard Operating Procedures.
- Develop a site plan for fish containment that includes appropriate use of screens, enclosures, netting, flood proofing, etc. as required.
- Install screens of an appropriate size and strength at all surface water intakes and all outlets to receiving waters.

- Periodically survey farm perimeters and use appropriate physical methods to prevent escapes.
- Examine risk variables according to the Ontario Ministry of Natural Resources security and containment standards and abide by the specified requirements for high, medium and low security facilities (see Standard Operating Procedures).

For cage culture operations, all aquaculturists will:

- Extend open-top nets to a height of at 0.7 metres above the surface to prevent jumping fish from escaping.
- Utilize nets having a mesh size sufficient to contain the smallest fish in the cage.
- Ensure that all equipment coming into contact with the net be designed to prevent entanglement and chaffing of the net.
- Inspect all nets for ice damage immediately following ice-in and ice-out and repair as necessary.
- Ensure that all nets maintain more than 67% of their manufactured rating by applying a standardized stress test according to the Standard Operating Procedures at intervals not exceeding 12 months and each time a net is emptied.
- Maintain a log recording the use and maintenance of each net.
- Discard all nets that fail testing standards.
- Conduct fish transfers such as stocking, grading or harvest in appropriate weather conditions and under constant visual supervision of at least one person and, when necessary, utilize shields or additional netting to prevent stray fish escapement during transfer.

7. *Predator Management*

Predation of farmed fish by birds and mammals is common at all fish farms causing the direct loss of fish and indirect losses in terms of stress-induced disease and reduced productivity. Nevertheless, aquaculture operations should not intentionally endanger natural predators. Therefore,

All aquaculturists will:

- Develop an anti-predator plan that utilizes selective anti-predator devices specific to the bird, mammal and/or fish predators encountered at the site.
- Install and maintain anti-predator devices to exclude predators from areas where live fish are held including deterrents such as:
 - predator netting;
 - bird netting;
 - authorized live trapping and relocation of fur bearers; and/or
 - other legal control measures.

8. Fish Health

Good husbandry is critical for aquatic animal health. Maintaining proper environmental conditions, selecting healthy fish, providing a nutritious diet, minimizing stress, vaccinating fish, and rapidly diagnosing, isolating, and treating disease outbreaks all are important aspects of good husbandry. Therefore,

All aquaculturists will:

- Utilize disease prevention strategies as a first line of defence against disease, including:
 - Applying good animal husbandry and management practices;
 - Maintaining good water quality in all rearing units;
 - Conducting routine inspections of farm stocks to observe behaviour and early indications of health problems and stress;
 - Utilizing stocking densities, handling, diets, etc. appropriate for the species and size of fish;
 - Remove dead and dying fish from the growing area in a manner that does not compromise the health and welfare of the remaining stock;
 - Implementing appropriate biosecurity measures; and
 - Using immuno-stimulants and vaccines, where appropriate.
- Develop a written Fish Health Management Plan for each farm site.
- Utilize professional fish health services and/or veterinary expertise to diagnose disease prior to initiating any disease treatment.
- When therapeutic agents are required:
 - Follow manufacturer's / veterinarian's instructions regarding dosage, frequency and duration;
 - Keep a current copy of the veterinarian's written recommendation;
 - Institute procedures to assure that the identity of treated animals is carefully maintained; and
 - Strictly uphold and verify prescribed withdrawal times before harvest to assure that no unsafe accumulation of therapeutic residues occur in the flesh of any fish intended for human consumption.
- When medicated feed must be administered, ensure that:
 - A prescription is obtained from a qualified veterinarian;
 - Feed is applied at the prescribed level for the prescribed period;
 - Staff are trained in the safe handling of pharmaceuticals;
 - Medicated feed is stored separate from regular feed and is properly identified; and
 - Necessary documentation and records are maintained.
- Purchase therapeutic agents and medications through authorized channels.
- Maintain accurate records of purchase, use and disposal of therapeutic agents, medicated feed, detergents, antifoulants, etc. to assure compliance with mandatory seafood inspection regulations and any information required by processors.
- Dispose of unutilized therapeutic agents and medicines according to conventional household hazardous waste disposal practices.
- Ensure that the potential for contamination of the environment will be minimized when using disinfecting agents and other therapeutic agents.
- Use environmentally-friendly detergents.

- Report mortalities to the relevant agencies as required.
- Ensure all chemicals and drugs are secured to prevent unauthorized use.

9. Harvest & Post-Harvest Practices

While some fish are marketed live to retailers, most fish that are produced for human consumption must be slaughtered prior to processing and distribution. Therefore,

All aquaculturists will:

- Utilize responsible handling, harvesting and post-harvesting technologies and procedures.
- Ensure that all fish are fasted sufficiently before harvest so as to induce an empty digestive system.
- Ensure that food safety measures are upheld by maintaining proper temperatures and quality control procedures during the harvest and transport of fish to processors.
- Process fish in accordance with the *Fish Inspection Act* (Canada) or the *Fish Inspection Act* (Ontario).

10. Feed Management

Feed is the largest cost component in raising fish and the principal source of metabolic by-products and nutrients that generate environmental effects. Aggressive feed management in the form of waste reduction and optimal feed conversion (using high-digestible feeds and ensuring that it is consumed rather than wasted) has proved to be an effective means to significantly reduce the environmental effects of aquaculture. Efficient diets, appropriate rations and proficient feeding systems are essential for productivity, economic efficiency, and protection of the environment. Therefore,

All aquaculturists will:

Feed

- Utilize feeds formulated to minimize waste output, taking into consideration fish species, fish size, performance and practicality.
- Feed in accordance with licence conditions respecting feed.
- Maintain complete records of origin, type and quantity of feed used.
- Exercise care when handling feed to minimize pellet damage or crushing to avoid creation of 'feed fines' - small particles that cannot be utilized by the fish.
- Store feeds in a manner to assure that it is secure from contamination, vermin, moisture and excessive heat.

Feeding Strategy & Delivery

- Utilize comprehensive production strategies that optimize growth, feed efficiency and waste management by calculating feed rations appropriate for the species, size of fish and the growing conditions.

- Establish feeding regimens for pond facilities based on the assimilative capacity of the pond for waste nutrients.
- Avoid feeding fish that are unduly stressed.
- Maintain up to date and accurate inventories of fish for use in calculating appropriate feed rations.
- Utilize feed distribution methods that ensure all fish have sufficient access to feed.
- Routinely monitor the operational efficiency of feeding equipment to avoid over- or under-feeding.
- Ensure that employees are adequately trained with regard to feeds, feeding strategies and feed monitoring.

Feed Monitoring

- Actively monitor feed delivery and the feeding behaviour of the fish to evaluate health status and avoid feed wastage.
- Compile data to measure and improve feed efficiency (i.e. feed conversion ratio).
- In pond facilities, utilize floating feeds to enable effective monitoring of feed consumption and waste, where appropriate.

11. Effluent / Nutrient Management

Release of solid (e.g. faeces) and soluble (e.g. phosphorus) metabolic by-products is the principal environmental concern of intensive aquaculture. Efforts to minimize the potential effect on receiving / surrounding waters and to continue to meet environmental standards are justified. Substantially different approaches are necessary in land-based and cage culture operations. Therefore,

For land-based operations, all aquaculturists will:

- Manage aquaculture effluent to prevent or minimize environmental impacts to receiving waters.
- Utilize waste management technologies applicable to the culture systems, be they ponds, raceways, tanks or recirculating systems.
- Segregate solid wastes from main process flows prior to effluent discharge and convey the slurry to an appropriate off-line storage or secondary treatment facility.
- Provide for disposal and/or processing of wastes to minimize the risk of environmental damage (e.g. application to arable land, composting).
- Comply with provincial protocols governing the utilization of agricultural wastes as a soil amendment when applying aquaculture wastes to arable lands.
- Position mechanical aerators in ponds to minimize erosion of pond bottoms and embankments.
- Use vegetative cover for erosion control on pond banks to minimize the discharge of suspended solids in runoff.

For cage culture operations, all aquaculturists will:

- Select and operate sites in accordance with the natural assimilative capacity of the surrounding ecosystem as part of an effective strategy for managing metabolic by-products from cage culture operations.
- Develop environmentally sound operational strategies for removing bio-fouling materials from nets, cages, moorings and other equipment, where necessary.
- Utilize feed management strategies to optimize performance and to minimize feed waste.

12. Other Organic Waste Management

Aside from waste by-products associated with feeding fish, other organic wastes produced during aquaculture operations (e.g. offal, compost, rubbish, etc.) can also have environmental effects. Therefore,

All aquaculturists will:

- Collect mortalities regularly and dispose of them using approved practices.
- Assure that kill water and/or blood water are disposed using approved practices.
- Collect and correctly dispose of processing wastes (offal, etc).
- Recycle wastes where possible and practicable.
- Utilize recyclable products where possible and practicable.

13. General Farm & Human Wastes Management

The potential environmental effects of all other wastes generated on-site also require effective management. Therefore,

All aquaculturists will:

- Make waste bins / dumpsters readily available and collect rubbish daily.
- Recycle or dispose of rubbish correctly.
- Separate biological wastes from other matter for appropriate disposal.
- Organize regular litter collection around and adjacent to the farm, regardless of the origin of the wastes.
- Designate an area for storing spare or discarded equipment and materials.

14. Chemical Handling & Storage

Proper storage and handling of fuels, lubricants, therapeutic agents and other chemicals is essential to maintaining a healthy and productive environment. Therefore,

All aquaculturists will:

- Store all fuels, lubricants, chemicals and therapeutic agents in a secure, well-ventilated, water tight building to prevent vandalism or unauthorized use of products.
- Maintain copies of Material Safety Data Sheets (MSDS) in the storage facility and in a separate on-site facility for those products commonly used.
- Develop a response plan for spills of fuels, lubricants, chemicals and therapeutic agents and other hazardous materials specifying response procedures and listing telephone numbers for key staff and regulatory authorities; ensure that all employees are familiar with the plan.
- Initiate appropriate clean-up and repair actions as soon as practicably possible following a spill.
- Report significant spills of fuels, lubricants, chemicals and therapeutic agents as required by law or as stipulated in the site licence / land-use permit.
- Be responsible for using products according to label instructions and disposing of out-of-date products and empty containers appropriately; e.g. used oil should be disposed of through recycling centres.
- Implement a regular maintenance schedule for tractors, trucks, vessels and/or other equipment to prevent oil and fuel leaks.

15. Human Health & Safety

Aquaculture operations must utilize technologies, equipment and practices that ensure the safety of the employees. Therefore,

All aquaculturists will:

- Provide a safe and stable workplace.
- Provide training appropriate to the responsibilities of employees engaged in aquaculture in the fields of:
 - first aid;
 - hazardous materials and waste handling;
 - use of chemicals and therapeutic agents;
 - alarm systems.
- Conduct routine inspection and maintenance of all facilities, equipment, vehicles, etc.
- Assure that facilities conform to all regulations concerning worker safety and public protection.

For cage culture operations, all aquaculturists will:

- Ensure that each employee and visitor to the site is provided with a personal floatation device.
- Provide additional training appropriate to the responsibilities of employees engaged in aquaculture in the fields of:
 - boat and equipment handling;
 - life-saving;
 - SCUBA diving; and/or
 - radio communication.

16. Information & Data Management

A comprehensive information and data management system is fundamental to success. It enables effective inventory-tracking and facilitates other monitoring and reporting requirements thereby reducing the risk of unnecessary environmental impact through better feed efficiency, lower risk of fish loss, etc. By enhancing consistency, information and data management make review, auditing, and assessment of risks easier and more effective. Therefore,

All aquaculturists will:

- Maintain accurate records regarding the control of product safety and quality and environmental stewardship according to the Standard Operating Procedures to provide detailed evidence of due diligence at the farm level.
- Maintain accurate and current inventory data, including:
 - quantify eggs, juveniles and/or adult fish stocked;
 - tracking of internal movements (transfers) of fish among tanks / cages;
 - origin (species, strain, age) of deliveries;
 - quantify fish lost to mortality and unexplained loss;
 - quantify fish lost to escape and/or predation; and
 - quantify fish harvested.
- Routinely monitor:
 - water quality;
 - the quality of other inputs and resources used in the production process;
 - off-farm environmental parameters (e.g. weather patterns) that are of immediate and direct relevance to the production process;
 - environmental standards and objectives; and
 - product quality and safety standards.
- Maintain accurate fish health records, including:
 - tracking incidents of disease;
 - detailed records of treatments; and
 - post-mortems and health control.
- Maintain paper copies of records for archival purposes.

17. Integrating with the Public

As a private sector initiative that requires public resources (namely water) for its operations, it is prudent for the aquaculture sector to maintain open and objective dialogue among stakeholders. Therefore,

All aquaculturists will:

- Recognize that the use of public resources confers responsibility on all users and respect the needs and rights of other users of public resources.
- Promote methods to minimize conflict among user groups.
- Engage in effective consultative mechanisms with governments, the community and other user groups to enable legitimate concerns and issues to be raised and solutions proposed.
- Promote goodwill in the local community and provide for farm visits and other opportunities for education and tourism.

- Be aware of the social contribution required of their professional activities and participate in local community planning and development.
- Recognize and promote the community benefit from monitoring and reporting on the state of the aquatic environment.
- Participate in programs of awareness to educate consumers, policy makers and the public about aquaculture.
- Co-operate with those involved in research, technology development and training activities that seek to improve the social and environmental compatibility of aquaculture.
- Where possible and practical, integrate facilities with local aesthetics (landscaping, cleaning, tidiness, excessive noise from generators, music, etc.).
- Avoid public display of potentially offensive activities (e.g. disposal of mortalities).

18. Compliance & Enforcement

As a self-regulatory initiative, BMPs are most effective when comprehensive compliance and enforcement mechanisms are established. Ultimately, the industry will work to develop a specific aquaculture environmental audit system, however, initial compliance and enforcement of the BMPs will be conducted as follows:

All members of the Northern Ontario Aquaculture Association (NOAA) will:

- Be obligated to comply with these Best Management Practices for Sustainable Aquaculture in Ontario.
- Establish an Ontario Aquaculture BMP Compliance Committee (BMPCC).
- Cooperate with the BMPCC and assist committee members with their reviews and analyses by submitting pertinent information as requested and facilitating access to production sites.
- Acknowledge that failure to cooperate with the BMPCC will be in breach of the BMPs.

ONTARIO AQUACULTURE BMP COMPLIANCE COMMITTEE CHARTER²

1. Purpose

- 1.1 The Ontario Aquaculture BMP Compliance Committee (BMPCC) will be the forum to hear concerns related to a member's compliance with the Best Management Practices for Sustainable Aquaculture in Ontario (BMPs), investigate the validity of those concerns, and recommend action to the Executive Committee of the Northern Ontario Aquaculture Association (NOAA) to ensure compliance with the BMP.
- 1.2 The BMPCC will:
- a) investigate allegations about the breach of the BMPs, as necessary;
 - b) assess the level of non-compliance with the BMPs;
 - c) recommend appropriate corrective actions and/or penalties for failure to comply with the BMPs to the NOAA Executive Committees; and
 - d) authorize use of the '*Ontario Sustainable Aquaculture*' logo (to be developed) by compliant members.

2. Composition and Appointment

- 2.1 Members of the BMPCC shall include representatives of the following stakeholder groups:
- | | |
|------------------------|-----------|
| Industry: | |
| Cage Culture Producers | 1 person |
| Land-Based Producers | 1 person |
| Government: | |
| Provincial Government | 1 person |
| Federal Government | 1 person |
| Other: | |
| Public Interest | 2 persons |
- 2.2 The Executive Committees of the NOAA shall appoint industry members of the Compliance Committee and invite government and public interest representatives to participate.

3. Tenure

- 3.1 BMPCC representatives shall be appointed for a term of two years.

4. Quorum

- 4.1 A quorum of the Committee will be 3, including at least one industry, one government and one public interest representative, one of whom is the Chair or Vice-Chair of the Committee.

5. Chair of Committee

- 5.1 The Chair and Vice-Chair of the BMPCC will be selected by the members of the BMPCC. The Chair will preside at meetings. When the Chair is not present, the Vice-Chair will preside.

² Adapted from the British Columbia Salmon Farmers' Association and modified to reflect the needs and circumstances of the Ontario aquaculture sector

6. Incapacity of a Member

- 6.1 When a member of the BMPCC is unable to act, an alternative member may be appointed to act in that member's absence. Replacement members will be agreed upon by the BMPCC members in advance of a meeting.

7. Conflict of Interest

- 7.1 A member of the BMPCC that has a conflict of interest in any matter to be considered by the Committee must declare the nature of the conflict to the Committee and withdraw from participation in considering the matter.

8. Powers of the Committee

- 8.1 The BMPCC will be given the necessary authority under the bylaws of the NOAA to fulfill its mandate as presented in subsection in 1.2.
- 8.2 The BMPCC may request the co-operation of NOAA members to assist in the enforcement of the BMPs, to place all pertinent information before the Committee, and/or to provide investigating members of the Committee with access to the site under investigation.
- 8.3 The BMPCC may establish a list of fees to initiate an investigation to recover the costs of its operation. The cost of initiating a complaint may be assessed against the member by means of a penalty if the complaint is ultimately determined to be valid.

9. Investigation and Review of a Complaint

- 9.1 The BMPCC may initiate an investigation or review of a member's practices on its own motion or at the request of a third party. All complaints reported to the NOAA shall be investigated by the BMPCC. Where a complaint is filed by a third party, the Committee will have the discretion, following a preliminary review of the complaint, to decide if an investigation or review is required.
- 9.2 The BMPCC may appoint one or more of its members or an independent third party to investigate a complaint about a member's compliance with the BMPs and gather information to assess the validity of the complaint. Information gathered will be presented to the Committee by the investigator. The investigator shall not participate in the decision on the validity of the complaint.
- 9.3 The BMPCC may establish a procedure to determine the validity of a complaint. That procedure may vary according to the nature of the circumstances but will:
- a) give notice to the member of the complaint with sufficient particulars to explain the complaint;
 - b) disclose all information gathered regarding the complaint to the alleged non-compliant member;
 - c) allow the member an opportunity to be heard and to present information; and
 - d) report the decision and its rationale to the member.

10. Report to the Executive Directors

- 10.1 Following the completion of an investigation and review of a complaint, the BMPCC will report to the Executive Committee of the NOAA its assessment of the member's compliance with the BMPs. The report shall also identify any recommended corrective actions and/or penalties necessary to bring the member into compliance with the BMPs.

- 10.2 The Executive Committee of the NOAA may establish:
 - a) policy guidelines to assist the BMPCC in interpreting the BMPs and determining compliance standards, and
 - b) penalty guidelines to assist the BMPCC with its assessment of appropriate corrective action and penalties. Such guidelines will be considered by the BMPCC but shall not necessarily be binding.
- 10.3 The Executive Committee of the NOAA may impose the recommended corrective action or penalties without the opportunity for further representation or appeal by the member.

11. Appeal

- 11.1 Following the release of a report from the BMPCC, the alleged non-compliant member may appeal the decision to the BMPCC in light of incorrect information contained within the report or in light of new information that may become available.
- 11.2 Appeals must be launched, in writing, within 14 days of receiving the BMPCC's final report.
- 11.3 A copy of the appeal shall be sent simultaneously to the Executive Committee of the NOAA.
- 11.4 The BMPCC shall decide, within 14 days of receiving a notice of appeal, whether the appeal contains sufficient evidence to warrant a further review of the matter.

12. Effect of Decision

- 12.1 In absence of a successful appeal, all decisions of the BMPCC shall be final and binding.

13. Monitoring and Enforcement

- 13.1 The BMPCC has the authority to monitor and enforce the penalties and compliance measures imposed by the Executive Committee of the NOAA.
- 13.2 The BMPCC may require the non-compliant member to provide periodic compliance reports as necessary.

14. Reporting on Committee's Activity

- 14.1 The BMPCC reports to the Executive Committee of the NOAA and shall prepare an annual report of its activities.

15. Administrative & Financial Support

- 15.1 The Executive Committee of the NOAA shall provide administrative support to the BMPCC.
- 15.2 The Executive Committee of the NOAA shall establish a budget and expense guidelines for the BMPCC and provide financial support to the BMPCC, as necessary.

16. Continuous Improvement

- 16.1 The BMPCC shall meet at least on a semi-annual basis to review overall member compliance with the BMPs, evaluate the effectiveness of the BMPs, address public concerns, review current legislation requirements and future environmental trends, etc. to ensure that the BMPs reflect current technological, environmental, product traceability and legislative requirements.

- 16.2 Upon completion of this analysis, the BMPCC shall recommend revisions to the BMPs as required and submit the recommendations to the Executive Committee of the NOAA for ratification at the next Annual General Meeting.

Appendix I - Legislation and Regulations Pertinent to Aquaculture in Ontario

(Source: Moccia and Bevan 2000 - supplementary information added)

Ontario Ministry of Natural Resources

FWCA	Fish and Wildlife Conservation Act - Ontario Fishery Regulations	Provide management, perpetuation and rehabilitation of wildlife	Aquaculture Licence (with monitoring and performance conditions) Licence to Stock Fish in Ontario Waters Licence to Collect Fish from Ontario Waters Bait-fish Dealers Licence.
LRIA	Lakes and Rivers Improvement Act	Ensure that alterations to water flow do not pose a hazard	Application for approval of project's location required with detailed plans and specifications to be submitted Permit for Construction, Fill or Alteration of a Watercourse
CAA BNWA PLA	Conservation Authorities Act Beds of Navigable Waters Act Public Lands Act	Preservation of habitat lying within established flood plains A lake-bed lease is required by cage culture operations Provides controlled use of public land, and cage culture areas	Licence of Occupation of Public Land or Crown Land Lease required when river or lake bottom is Crown property
ARA COC	Aggregate Resources Act Code of Containment	Regulates aggregate removal from water courses Containment guidelines established by MNR	Applicable to land-based ventures only
Ontario Ministry of the Environment			
OWRA	Ontario Water Resources Act	Management of surface and groundwater quality and quantity	Permit to Take Water required for > 50,000 litres/day Certificate of Approval required for wastewater treatment works. Well construction permit required by all water well contractors. Certificate of Approval for Organic Waste Management System and for off-property disposal. Certificate of Approval required for back-up generators Spills to the environment Permit to Purchase and/or Perform a Water Extermination required before any pesticide is applied to surface waters
EPA	Environmental Protection Act	Provide protection and conservation of the natural environment	Permit to Purchase and/or Perform a Water Extermination required before any pesticide is applied to surface waters
PA	Pesticides Act	Control the availability and use of pesticides	Permit to Purchase and/or Perform a Water Extermination required before any pesticide is applied to surface waters
EAA EBR	Environmental Assessment Act Environmental Bill of Rights	Allows environmental assessment to be carried out Registry for posting of legislative amendments and instruments	Provides opportunity for public review of all environmental permits posted and issued
Conservation Authority			
CAA	Conservation Authorities Act	Controls development within flood plains (see OMNR).	
Agriculture Food and Rural Affairs			
VA	Veterinarians Act	Regulates drug use.	
Fisheries and Oceans Canada			
FishA	Fisheries Act of Canada	Protection of fisheries and their habitat. Import/export of fish	Prohibits harmful alteration of fish habitat Prohibits deposition of deleterious substances into water Import Permit required for inter-provincial movement of salmonids
FHPR	Fish Health Protection Regulations	Regulates movement of certain fish species throughout Canada	
NWPA	Navigable Waters Protection Act	Protects navigational safety in public waters	Approval or exemption required; site marking guidelines apply
ITP	Introductions & Transfers Policy	Controls on the introduction and transfer of aquatic organisms	
Agriculture and Agri-Food Canada & Canadian Food Inspection Agency			
HAA	Health of Animals Act	Import and registration of biologics and fish vaccines	
FeedsA	Feeds Act	Regulates feed quality and drugs in feed	
Health Canada & Pest Management Regulatory Agency			
FDA	Food and Drugs Act	Approval of drugs used in animals, including fish and smoked fish products	
PCPA	Pest Control Products Act	Registration of pesticides.	
Environment Canada			
CEAA	Cdn Environmental Assessment Act	Integrates environmental factors into planning process.	Mandatory where federal approval / permit is required
CEPA	Cdn Environmental Protection Act	Provides protection and conservation of the natural environment.	
MBCA	Migratory Birds Convention Act	Protection of certain bird species	Scare Permit or Damage-Kill Permit may be issued by Canadian Wildlife Service to deter herons Defines suitability of potential sites
Siting	Site Classification	Recommendation for operational water quality monitoring at cage culture aquaculture operations	

BEST MANAGEMENT PRACTICES FOR SUSTAINABLE AQUACULTURE IN ONTARIO

Environmental Policy Statement

I, _____, as _____ of
<Name> *<Title>*
_____,
<Name of Venture>

do solemnly declare that I / we will:

- 1. Comply with all existing legislation and regulations applicable to the operation.*
- 2. Adhere to the Best Management Practices for Sustainable Aquaculture in Ontario and support the continuous improvement of the BMPs.*
- 3. Site, design and operate our farms in ways that utilize water resources responsibly and maintain a healthy environment.*
- 4. Strive for continual improvement in feeds and feeding, fish health, waste management and facility security to minimize impacts.*
- 5. Respect the rights and safety of other users of the resource base.*
- 6. Strive to improve the quality of life in local communities.*
- 7. Facilitate research, technology and educational in support of these principles.*

Endorsed this _____ day of _____, 2006

<Signature>