



F E D E R A L

AQUACULTURE

DEVELOPMENT

S T R A T E G Y

Canada

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BACKGROUND

Aquaculture is a formidable policy challenge. As a new industry, it straddles the line between fishing and farming, cuts across significant regional differences, and is placed in a complex jurisdictional context involving the participation of municipal, provincial/territorial and federal governments.

The Federal Aquaculture Development Strategy is the culmination of several years of consultations and deliberations on the best means of building a federal policy framework in which the aquaculture industry can flourish. The Strategy is the natural next step to a series of federal policy milestones, including:

1984 • Prime Minister names the Department of Fisheries and Oceans as the lead federal agency responsible for aquaculture.

1986 • First Ministers agree to a statement of national goals and principles for the development of aquaculture.

1987 • Establishment of the Canadian Aquaculture Producers' Council as a national voice for the industry.

1986-89 • Negotiation of federal-provincial Memoranda of Understanding clarifying the delineation of responsibilities between levels of government.

1988 • Standing Committee on Fisheries and Oceans launches report entitled "Aquaculture in Canada" which recommends that the Minister of Fisheries and Oceans take a proactive role in supporting aquaculture development in Canada.

1990 • Launch of a Department of Fisheries and Oceans strategy for the development of aquaculture.

1992 • First Canadian Aquaculture Planning Forum in Montreal brings industry and government stakeholders together to discuss aquaculture and identify 47 strategic recommendations for industry and government action.

1993 • Second Canadian Aquaculture Planning Forum held in Campbell River, B.C. to chart the course for a policy framework designed to enable aquaculture development. The Forum leads to the development of the Federal Aquaculture Development Strategy.

1994 • Extensive consultation on the Strategy involving over 350 stakeholders in aquaculture throughout Canada and around the world.

The Federal Aquaculture Development Strategy is a tool for fostering partnerships and cooperation between industry and all levels of government. These collaborative efforts will help maximize the sustainable use of aquatic resources and increase industry's productivity, with a view to generating wealth and employment opportunities for Canadians.



1.0 • INTRODUCTION

The Federal Aquaculture Development Strategy is based on extensive stakeholder consultations¹ and outlines the federal role which will enable industry development in a manner that complements the roles and responsibilities of industry, academia, provincial and territorial governments. It represents the “best effort” at carving out a niche for federal involvement that matches its capabilities and responsibilities with the needs of the aquaculture sector.

The Strategy is designed to guide the sustainable management of Canada’s aquatic resources for the production of high quality fish and seafood, and for the generation of wealth and employment for Canadians. It outlines a cooperative management framework that will be used to identify and resolve constraints and challenges to industry development. Under the Strategy, the federal government will foster provincially/territorially-based aquaculture development within a national framework. Federal support will be pursued in a manner that is sensitive to provincial, territorial and sectoral differences in industry circumstances and needs.

The Federal Aquaculture Development Strategy rests on two pillars: enabling the aquaculture industry to expand and remain competitive, and promoting preliminary and pre-competitive new species development. These twin focal points will allow the Strategy to facilitate long-term sustainable growth.

Sustainable industry development will be supported by enabling industry to continually upgrade its capability to secure and maintain competitive advantage. It will be up to industry to seize the opportunities for commercial development by utilizing those enhanced capabilities to deliver value to their customers at competitive prices. As part of their role in the aquaculture development partnership, the provinces and territories

will also deliver programs on a local level and provide on-going support and expertise to aquaculturists in their jurisdictions.

The coordination framework for the Strategy is built largely on reallocation of existing resources and the formation of partnerships and is designed to provide on-going, flexible direction to supporting aquaculture development in Canada. This broad direction, spear-headed by the lead agency, the Department of Fisheries and Oceans, will be complemented by specific Action Plans prepared by each federal department and agency involved in the Strategy. The Action Plans will be updated on a regular basis to ensure that the Federal Aquaculture Development Strategy remains responsive in the evolving context of international competition.

All Strategy initiatives are designed to promote *sustainable* development, that is to say, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (*Our Common Future*, World Commission on Environment and Development, Brundtland, G.H. and Khalid, M., 1987). This is in keeping with the International Council for the Exploration of the Seas (ICES) position that aquaculture, when properly managed, is an environmentally sound commercial activity. Recognizing that the success of Canada’s aquaculture industry is dependent on a clean and pristine environment, the federal government is committed to ecologically and environmentally sound aquaculture development.

¹Throughout this document, the term stakeholders is used to describe collectively, that group of individuals having a direct stake in the aquaculture sector. This includes industry owners and employees, as well as participants in the supplies and services sector. Indirect stakeholders include academics and researchers, government officials with a mandate or interest in aquaculture, owners of property near aquaculture installations and resource users, including boaters, commercial and recreational fishers.

2.0 • PROFILE OF THE AQUACULTURE INDUSTRY

Worldwide, fisheries and aquaculture are at a turning point. While global demand for fish and seafood is expected to grow steadily to reach 120 million tonnes by the beginning of the 21st century, wild fisheries catches have peaked around 100 million tonnes and have begun to decline. Canada has been particularly hard hit by this downturn, both in job losses and decreases in exports. At the same time, aquaculture continues to develop at a remarkable pace.

Commercial aquaculture in Canada began in the 1950s, and remained in a “developmental” state until the early 1980s (See Figure 1). The early years were characterized by considerable individual effort, but little cooperation or synergy. Production was focused on trout culture in Ontario and British Columbia, and oyster culture in British Columbia, Prince Edward Island, and New Brunswick.

Producers made considerable gains in productivity but remained constrained by poor access to specialized supplies and knowledge.

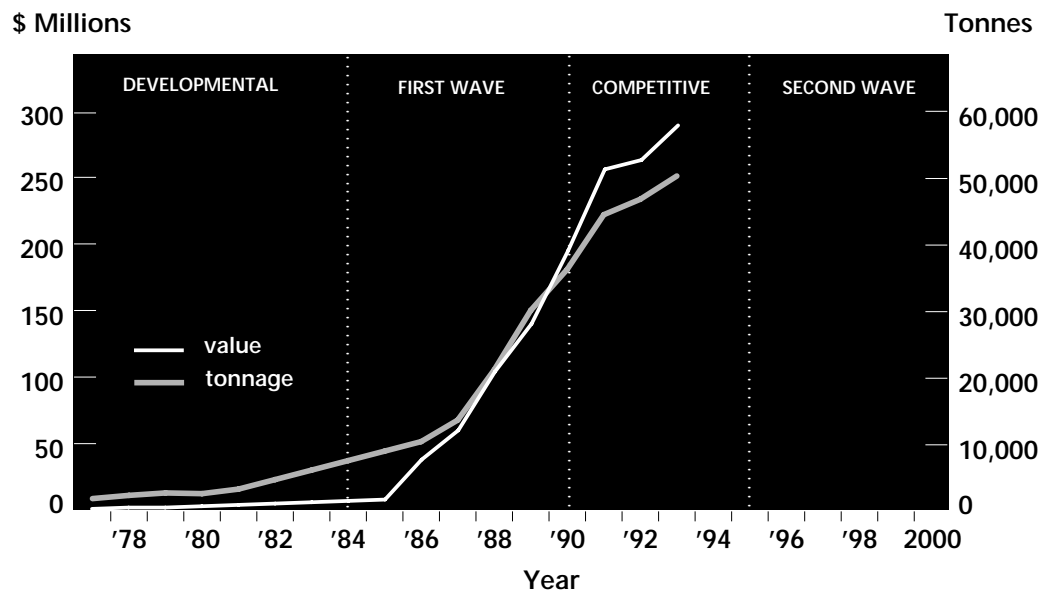
Aquaculture is the culture of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Culture implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Culture also implies individual or corporate ownership of the stock being cultivated.

Derived from the United Nations' Food and Agriculture Organization (FAO)

The “first wave” of aquaculture development took place between 1984 and 1991. During this seven year period, industry value increased more than 36-fold from \$7 million² in 1984 to more than \$256 million in 1991 – an extraordinary average growth rate of 67% per year. With increased interest and investment in aquaculture, avenues of communication and technology transfer opened up, allowing knowledge and skills to be more widely disseminated. At the same time, the infrastructure needed for growth and expansion, including feed manufacturing, applied research and a supplies and services network, was being assembled. The industry expanded to every province and the Yukon Territory and the species base broadened to include salmon,

² All figures in Canadian dollars.

FIGURE 1 • Evolution of Aquaculture Development in Canada



mussels, clams, scallops, arctic char and marine plants, with even more species under development for commercial cultivation. A critical mass was beginning to form, and efforts to develop aquaculture became increasingly coordinated.

With few barriers to entry, and the prospect of attractive returns, world production increased significantly during this period. A number of countries emerged as major cold water aquaculture producers in the late 1980s and early 1990s – namely, Norway, the United Kingdom, Chile, Spain and Japan. In 1991, 19% of all fish and seafood consumed globally was produced through aquaculture.

This expansion, and the simultaneous globalization of fisheries trade, has created enhanced pressures in international markets. As a result, the Canadian aquaculture industry evolved rapidly into its present “**competitive**” phase, which is characterized by a levelling off of production tonnage and value. In response, industry and governments are forging collective strategies to help Canadian companies realize the full potential of aquaculture.

Today, more than \$289 million in revenue is generated by Canadian aquaculture producers (see Figures 2 and 3). Salmon, oysters, mussels, clams, scallops, trout and char are the principal farm-raised species. Aquaculture now accounts for more than 17% of the total landed value of the Canadian fisheries sector. In 1993, total output from the sector was 50,375 tonnes, or 6% of total Canadian fisheries production. Additionally, the supplies and services sector of the aquaculture industry generates more than \$266 million annually, including more than \$53 million in exports.

Aquaculture is recognized as a growing source of employment and offers the possibility for social and economic improvement in communities with limited economic alternatives. Aquaculture provides jobs for more than 5,200 Canadians – some 2,800 in the production sector and 2,400 in the supplies and services sector.

FIGURE 2 • Value of Canadian Aquaculture 1993

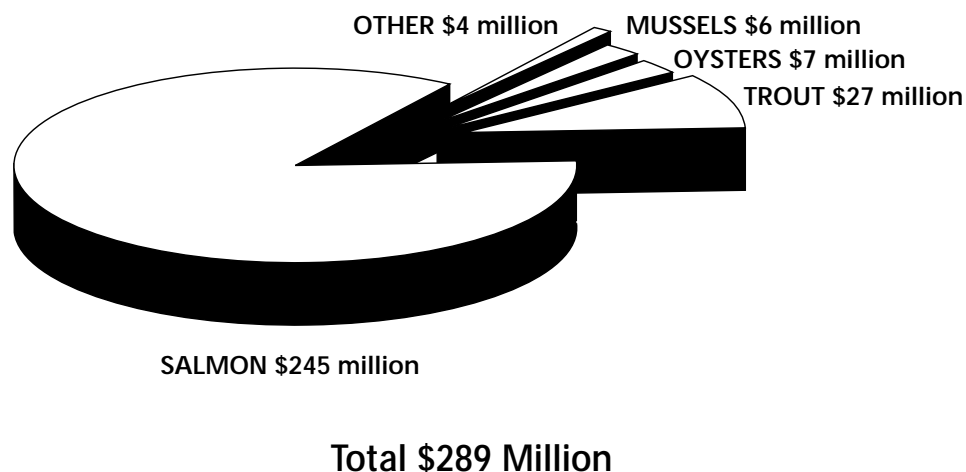


FIGURE 3 • Canadian Aquaculture Production 1993

	ATLANTIC		CENTRAL		PACIFIC		TOTAL	
	tonnes	\$ millions	tonnes	\$ millions	tonnes	\$ millions	tonnes	\$ millions
Finfish								
Salmon	11,096	95.8	27	0.2	21,400	149.0	32,523	245.0
Trout	414	2.6	4,738	23.6	115	0.6	5,267	26.8
Steelhead	403	2.8	-	-	-	-	403	2.8
Char	27	0.2	28	0.3	5	< 0.1	60	0.5
Cod	5	< 0.1	-	-	-	-	5	< 0.1
Sub Total	11,945	101.4	4,793	24.1	21,520	149.6	38,258	275.1
Shellfish								
Manila Clam	-	-	-	-	400	1.5	400	1.5
Oyster	1,278	2.6	-	-	5,250	4.2	6,528	6.8
Mussel	5,141	5.7	34	< 0.1	-	-	5,175	5.7
Scallop	4	< 0.1	-	-	10	< 0.1	14	0.1
Sub Total	6,423	8.3	34	< 0.1	5,660	5.7	12,117	14.1
TOTAL	18,368	109.7	4,827	24.2	27,180	155.3	50,375	289.2

Pacific = British Columbia

Central = Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Territories

Atlantic = New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland



3.0 • AQUACULTURE AT A CRITICAL JUNCTURE

The question now facing Canada is this: how will the aquaculture industry overcome its plateau and forge ahead into the “second wave” of growth?

In 1993, Canada ranked 27th in the world in aquaculture production. The Canadian sector represents less than 0.3% of global aquaculture production.

The comparatively small size of our aquaculture industry is not commensurate with our potential, given that Canada has an abundance of natural resources ideally suited to the sector. In addition, Canadians have acquired internationally-recognized technical and management expertise in the sector, and have developed state-of-the-art facilities for the production of high-quality cultured fish and seafood. Our geographical setting is also advantageous as we have easy access to the vast Pacific Rim and North American fish and seafood markets. If Canada can translate its significant advantages into industry growth, it has the potential to be a world leader in aquaculture.

Clearly, the sector is at a pivotal juncture. Canada has tremendous potential for success in aquaculture. If certain critical success factors are fulfilled, stakeholders expect that the total farm-gate value of aquaculture could reach \$680 million annually by the end of the century

FIGURE 4 • Aquaculture Outlook to the Year 2000: Value

	Industry Value (\$Millions)		
	1984	1991	2000*
Farm-Gate Production	7	256	680
Supplies & Services	–	266	560

* Projections based on consultations with stakeholders³

³ Between October and December 1993, meetings were held with more than 200 representatives of industry, government and academia. Stakeholders were asked to work collaboratively and prepare projections on aquaculture value and production in the year 2000. These extrapolations were analysed, and are presented here as targets for realistic and sustainable aquaculture development in Canada (see Figure 6).

FIGURE 5 • Aquaculture Outlook to the Year 2000: Employment

	Industry Employment		
	1984	1991	2000*
Production Employment	< 200	2,825	8,125
Services Employment	–	2,355	4,100

* Projections based on consultations with stakeholders³

(see Figure 4)³. This would represent an average growth rate of approximately 11% per year between 1993 and 2001 – a rate that is realistic and sustainable. In concert, the supplies and services sector is projected to generate an additional \$560 million annually in domestic and export sales by the turn of the century. In total, the aquaculture sector could generate more than \$1.2 billion in annual revenues – half of which would come from export sales.

Based on current employment trends in the sector, and assuming a 25% improvement in workforce productivity, this level of production could support approximately 8,125 production jobs and 4,100 positions in the related supplies and services sector. This could effectively generate an additional 7,000 *new* jobs in the sector compared to current employment levels – jobs that would be based mostly in coastal and rural communities (see Figure 5)³.

This projected tripling of annual output will not be realized simply because the potential exists. The Canadian aquaculture industry continues to face a number of competitive and developmental challenges.

The two key issues to be addressed are increasing global competition and policy and regulatory constraints. The increase in global competition is forcing prices down, thereby putting pressure on producers to reduce their

total cost of production to remain internationally competitive. The picture is further complicated by increasing competition from producers of beef, pork, poultry, and even pasta, all of whom are vying for a share of consumers' "stomach space."

This international trend is compounded by the domestic challenge of an outdated policy and regulatory framework. Canadian aquaculturists are currently operating with policies and regulations that were, for the most part, designed for the capture fishery. Canadian aquaculturists do not want weak regulations; they want regulations that are appropriate to their business.

Clearly, a number of critical success factors must be fulfilled for industry development to continue. Among these factors, coordination of support initiatives and removal of constraints are paramount if the full potential of the Canadian aquaculture sector is to be realized.

We must work together to enable industry development by creating a business environment that stimulates growth in a focused manner. Industry must be able to address competitive challenges and seize emerging opportunities to continue its growth and development. To tackle these issues in an orderly and effective manner, we need a framework, a strategy, to guide us.

FIGURE 6 • Canadian Aquaculture Outlook to the Year 2000

	ATLANTIC		CENTRAL		PACIFIC		TOTAL	
	tonnes	\$ millions	tonnes	\$ millions	tonnes	\$ millions	tonnes	\$ millions
Existing Species								
Salmon/Trout	34,000	207.0	14,900	48.6	40,500	247.0	89,400	502.6
Mussels	18,000	20.0	500	0.5	–	–	18,500	20.5
Scallop	3,100	48.0	200	3.0	100	0.3	3,400	51.3
Oyster	5,000	8.0	–	–	30,000	24.0	35,000	32.0
Manila Clam	–	–	–	–	7,500	25.0	7,500	25.0
Sub Total	60,100	283.0	15,600	52.1	78,100	296.3	153,800	631.4
New Species								
Cod	4,000	7.0	–	–	75	0.1	4,075	8.3
Halibut	600	8.0	–	–	50	0.7	650	8.7
Haddock	600	4.0	–	–	–	–	600	4.0
Flounder	300	1.3	–	–	–	–	300	1.3
Sablefish	–	–	–	–	2,000	3.0	2,000	3.0
Pollock	1,000	5.5	–	–	–	–	1,000	5.5
Striped Bass	200	1.3	–	–	–	–	200	1.3
Arctic Char	700	7.7	–	–	40	0.4	740	8.1
Eel	50	0.3	–	–	–	–	50	0.3
Clams	400	2.0	–	–	–	–	400	2.0
Geoduck	–	–	–	–	100	2.2	100	2.2
Sturgeon	–	–	900	4.0	–	–	900	4.0
Kelp	–	–	–	–	100	0.1	100	0.1
Sub Total	7,850	37.1	900	4.0	2,365	6.5	11,115	48.8
TOTAL	67,950	320.1	16,500	56.1	80,465	302.8	164,915	680.2

Pacific = British Columbia

Central = Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Territories

Atlantic = New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland

4.0 • TOWARD SUSTAINABLE AQUACULTURE DEVELOPMENT

Extensive stakeholder consultations revealed that for the Canadian aquaculture industry to reach its full potential, a number of critical success factors must be addressed and resolved.

The Federal Aquaculture Development Strategy is designed to address these critical success factors in a framework of shared responsibility. Efforts will focus on enabling the expansion of commercial aquaculture, and supporting development of new aquaculture species.

4.1 • Government Role

Government policies and programs shape the environment in which industry operates, and thus influence industry's competitiveness. For example, in Canada, government regulations significantly affect accessibility to production sites, the availability of safe and effective therapeutants and access to a trained workforce.

Aquaculture development must not be unduly constrained or burdened by government policy or the regulatory framework. At the same time, however, aquaculture development must be consistent with government responsibilities in such areas as habitat and biodiversity. Domestic and international experiences indicate that government support efforts should be focused on creating a positive framework to enable long-term, sustainable industry development.

Specific federal and provincial responsibilities are addressed by Aquaculture Memoranda of Understanding (MOU). These MOUs delineate, on a

provincial and territorial basis, the respective role of each level of government.

The government's promotion of the aquaculture industry must be balanced with a respect and concern for other uses of aquatic resources. The Federal Aquaculture Development Strategy is designed to enable industry development while ensuring that environmental integrity is maintained.

CRITICAL SUCCESS FACTORS

Government Commitment to Aquaculture Development

*Improved Industry - Government Partnerships
Focused Research and Enhanced Technology Transfer*

*Training, Education and Skills Development
Regulatory Reform – Supportive Regulatory Framework*

Access to High Quality Production Sites

Effective Fish Health Management

Enhanced Marketing Efforts

Access to Investment and Operating Capital

Enhanced Public Awareness

Coordination of Government Initiatives

Strategic Aquaculture Development Plan

- Government provides responsible stewardship of public aquatic resources while leaving the aquaculture industry with sufficient latitude to conduct business economically.
- Government initiatives are primarily directed toward supporting infrastructure (i.e. R&D, education and training, etc.) and toward creating a regulatory and policy framework conducive to industry development.

Recognizing that the aquaculture industry varies significantly from one region to another, federal initiatives under the

Federal Aquaculture Development Strategy will be coordinated with the provinces and territories on a case-by-case basis. This collaborative approach will maximize the effective management of resources while minimizing overlap and duplication.

Essentially, the government plays a catalytic role in promoting industry development. Governmental support for aquaculture is largely indirect.

4.2 • Industry Role

The aquaculture industry is responsible for its own commercial success and competitiveness. It is up to industry to seize opportunities for commercial development and strive to remain competitive in a global economy.

The Canadian aquaculture industry is endowed with considerable management expertise, an excellent scientific infrastructure, extensive and productive marine and fresh-water resources and well-established domestic and international markets.

Nevertheless, the Canadian aquaculture industry currently faces increasing competitive pressures. To remain internationally competitive, the industry must address those factors which will lead to lower production costs and enhanced marketing capabilities. These include:

- competitively priced broodstock, seedstock, feed, and equipment;
- high quality, clean and productive growing sites;
- safe and effective therapeutants;
- technological leadership for improved husbandry, new species development, innovative products and enhanced productivity;



- effective farm and business management techniques;
- a skilled workforce;
- effective marketing mechanisms and market intelligence;
- investment and operating capital;
- a role in shaping a more transparent and consistent policy, economic and regulatory environment.

The constant of the international aquaculture industry is change itself. Innovations leading to improved aquaculture productivity will surely continue into the next

century. To remain internationally competitive, Canadian producers must sustain the relentless pursuit of technological and management improvements that allow Canada to gain stature in world aquaculture. The capability to produce and market desired products at internationally competitive prices is paramount to sustained development.

5.0 • PRINCIPLES FOR AQUACULTURE DEVELOPMENT

In supporting industry development, federal officials will be guided by eleven principles:

1. Aquaculture development is a priority of the federal government, and will be given specific policy and developmental considerations. Government will create a climate in which aquaculture can flourish.
2. Aquaculture is a private sector initiative. The principal responsibility for commercial development will rest with the industry.
3. Aquaculture is a legitimate user of land and water; consequently, industry deserves equitable access to the aquatic resource base.
4. Aquaculture development must be driven by the dictates of industry competitiveness in domestic and international markets.
5. Aquaculture development must be consistent with government responsibilities, such as public health and safety, navigation and the environment.
6. Aquaculture will be considered in the development of fisheries management policies.
7. Aquaculture development will be regionally focused and implemented, in a manner consistent with national objectives, and standards.
8. Harmonization of federal and provincial policies and regulations is essential to aquaculture development.
9. Development of a viable supplies and services sector is an essential industry component.
10. R&D and technology transfer are prerequisite for industry development.
11. An appropriately-trained workforce is essential to aquaculture development in a global economy.



6.0 • STRATEGIC PLAN

The federal role in aquaculture development is divided into the following components:

- Research
- Technology Transfer
- Training and Development
- Regulatory Framework
- Environmental Sustainability and Interaction
- Resource Allocation and Access
- Product Safety and Inspection
- Market Intelligence and Services
- Access to Financing
- Communications
- Performance Measurement and Improvement
- Implementation Structure

6.1 • Research

Aquaculture is technology-intensive and necessitates considerable research information. Maintaining a competitive edge requires access to practical, commercially-oriented research that continues to broaden the technology and knowledge base of the sector. Decisions regarding the goals and objectives of research initiatives must reflect the views of all stakeholders, particularly industry.

The Federal Government Will:

- Work with industry-government Aquaculture Implementation Committees (See Section 7.0) to design flexible, multi-year basic and applied cost-shared aquaculture research programs.

The programs will have two dimensions. First, they will promote research that supports industry competitiveness and new species development. Second, they will support the generation of information necessary for fulfilling government's statutory responsibilities regarding health, safety, and the environment.

The research programs will include:

- broodstock and seedstock management;
 - species early life history;
 - nutrition and physiology;
 - finfish and shellfish health, including disease diagnosis and management;
 - engineering and technology development;
 - environmental impacts and interactions;
 - aquaculture/habitat interactions; and
 - multi-disciplinary interactions such as oceanography and phycotoxins, carrying capacity and inter-specific competition.
- Require registration of federally funded aquaculture R&D projects (where applicable) to enable tracking of research initiatives and prevent duplication.
 - Facilitate enhanced private sector investment in research and promote public/private partnerships for research.
 - Develop partnerships between academic institutions and federal research agencies, including the Department of Fisheries and Oceans, Industry Canada, National Research Council (NRC), NRC/Industrial Research Assistance Program (IRAP), Natural Resources Canada, etc. to coordinate research efforts.
 - Enhance research efforts to develop techniques for detecting and monitoring therapeutic residues in products.
 - Continue monitoring and research on phycotoxins and establish appropriate management regimes to ensure that products meet consumer safety requirements.

- Work with existing research facilities to designate and support regional centres for aquaculture research and ensure that these centres are adequately staffed and resourced.

6.2 • Technology Transfer

Timely and effective dissemination of technological innovations is essential for improved productivity. This includes transfers from other countries, and adaptation for use in Canada. On-going consultation between researchers and clients is an important component of the technology transfer process.

The Federal Government Will:

- In cooperation with industry and the provinces/territories, develop a timely, strategic approach to acquire and disseminate technological innovations domestically and abroad. Areas will be identified where industry can acquire technology and imitate existing approaches, rather than re-creating technological development.
- Forge federal partnerships between departments and agencies, such as Industry Canada, the National Research Council, Technology Development Officers in Canadian embassies abroad, Natural Resources Canada, and the Department of Fisheries and Oceans to ensure a coordinated federal approach to technology transfer.
- Work in partnership with industry and the provinces/territories to ensure that technology transfer components are incorporated, where possible, into federally-funded research initiatives.
- Review existing technology transfer mechanisms in the federal system to ensure that they effectively meet industry priorities for development.
- In cooperation with industry and the provinces/territories, coordinate and host technology transfer workshops.

6.3 • Training and Development

The Canadian aquaculture industry requires a human resource base with strong technical and analytical skills. To build a strong aquaculture workforce, aquaculture training programs at colleges and universities need to be enhanced. Mechanisms to provide on-going skills upgrading for existing employees must also be developed. In addition, government officials who make decisions affecting industry development must understand the nature of the aquaculture business and how their decisions and policies can affect industry's competitive capabilities.

The Federal Government Will:

- Work closely with the provinces/territories to ensure that resources dedicated to training and education are targeted toward mutually agreeable initiatives in aquaculture.
- In cooperation with the provinces/territories, support prospective and current industry members in obtaining and upgrading the necessary practical skills.
- In conjunction with industry and the provinces/territories, identify means to provide support for co-operative education.
- In conjunction with industry and the provincial governments, develop occupational standards and other training and educational initiatives that meet the skill requirements of the aquaculture industry at all occupational levels.
- Designate funds for scholarships supporting aquaculture researchers.
- Introduce components on aquaculture into existing government training initiatives, as appropriate, to ensure that federal employees who make decisions affecting the aquaculture industry are familiar with the industry and its requirements. Short training courses on aquaculture will also be used to inform government employees at all levels about the aquaculture sector.

6.4 • Regulatory Framework

The explosive growth of aquaculture over the past decade has out-paced government efforts to amend applicable legislation. As a result, the sector is affected by several regulations that were not initially designed for the industry and which regulations introduce necessary costs to operators. International competitiveness in aquaculture is contingent upon a streamlined and consistent federal and provincial/territorial regulatory framework that fulfils health, safety and environmental guidelines while minimizing the economic impact to producers.

The Federal Government Will:

- Undertake a comprehensive review of all federal legislation and any accompanying regulations to identify and remove, where appropriate, constraints to aquaculture development.
- Work to ensure that all federal legislation and regulations are applied equitably across Canada.

6.5 • Environmental Sustainability and Interaction

Interaction between aquaculture operations and the environment is complex. The viability of aquaculture operations is directly dependent on the maintenance of a healthy and productive aquatic environment. Coastal pollution is harmful to aquaculture development. If improperly managed, however, aquaculture operations can themselves be detrimental to the environment. Consequently, sustainable aquaculture development demands that aquaculturists operate within stringent environmental standards. Care must be taken to ensure the integrity of all aspects of the aquatic environment, including seafloor and substrates, biodiversity, habitat and disease transfer. Aquaculturists and environmentalists are natural allies in their work to protect the aquatic environment.

The Federal Government Will:

- In cooperation with the provinces/territories and industry, develop and implement a responsive and effective regulatory and policy framework to ensure that aquaculture is conducted in an environmentally sustainable manner.
- In conjunction with the provinces/territories and industry, develop environmental codes of conduct tailored to regional circumstances.
- Work with industry to assist aquaculturists in complying with regulations aimed at ensuring sustainable development.
- Work with industry to support initiatives aimed at developing production technologies which result in minimal nutrient output from aquaculture sites, and which seek to minimize the use of therapeutants and develop alternatives to such therapeutants.
- Work with the provinces, territories and municipalities to ensure that the waters used by aquaculture operations are not degraded by those operations or by other aquatic or land-based sources of pollution.
- Develop a systematic framework for conducting environmental impact assessments, developing risk assessment models and class assessments, pursuant to the *Canadian Environmental Assessment Act*.

6.6 • Resource Allocation and Access

The aquaculture industry requires increased access to seedstock and to coastal and inland aquatic resources. Among commercial, recreational, aboriginal and municipal user groups, aquaculture must be afforded equitable access. Improvements are required in the current system of allocating access to the aquatic resources.

The Federal Government Will:

- Cooperate with the provinces, territories and user groups to develop effective and equitable coastal zone management plans.

- Establish pilot projects for new approaches to resource management, including community-based management.
- In conjunction with industry and the provinces and territories, work to establish guidelines for minimum use of aquatic tenures to maximize productivity of resources in a sustainable manner. Establish minimum performance standards to ensure an optimal usage of resources consistent with the goal of wealth creation for Canadians.
- Coordinate approaches to ensure the availability of safe and effective therapeutants for use in aquaculture.
- Continue to ensure that the management of areas for shellfish aquaculture is in accordance with the Canadian Shellfish Sanitation Program and applicable international shellfish requirements.

6.7 • Product Safety and Inspection

Successful marketing of aquaculture products depends on consumer confidence in product safety and quality. Sustained development in the aquaculture sector depends on the availability of safe, healthy and high-quality products.

The Federal Government Will:

- Continue to fulfil its mandated responsibility to assure the safety of Canadian seafood.
- Work with industry and provincial/territorial officials to identify, develop and implement approaches to ensure that federal and provincial/territorial government health and safety responsibilities are fully met in a fair, practical and environmentally sound fashion.
- Provide a seat for the aquaculture sector on the Seafood Inspection Policy Advisory Committee (SIPAC), and allocate as many seats as are required on the SIPAC Technical Advisory Committees to ensure that industry perspectives are fully reflected. Shellfish aquaculturists will be afforded fair representation.
- In conjunction with the provinces/territories, design and deliver seminars, workshops and training programs to industry on inspection, product safety, and the safe use of therapeutants in aquaculture.
- Continue to harmonize national and international inspection procedures and ensure consistent interpretation and implementation.

6.8 • Market Intelligence and Services

In the face of ever-increasing competition, it is essential for the aquaculture sector to be armed with market intelligence. Market information and intelligence is as vital a component to success as technological knowledge and capacity. This market information will allow industry to adapt quickly to changes in domestic and international markets.

The Federal Government Will:

- Support industry-driven marketing and market research efforts.
- In cooperation with industry, provinces/territories and other government agencies, undertake an in-depth assessment and economic analysis of international marketing and competitiveness and communicate this information to industry.
- Provide market intelligence and promotional support through the Department of Foreign Affairs and International Trade's network of Trade Commission Services.

6.9 • Access to Financing

Financial and business risk factors combine to preclude affordable access to investment and operating capital for many aquaculturists. Although industry must bear the primary responsibility for meeting the requirements of financiers, government also has a role to play. Government policies and regulations can greatly influence the relative attractiveness of the industry to investors and financiers.

The Federal Government Will:

- Endorse aquaculture as a viable industry in Canada, thereby providing evidence of a long-term commitment to the development of the sector.
- Facilitate increased access to private sector capital by putting in place a regulatory and policy framework that is more conducive to attracting private sector investment.
- Include aquaculture among eligible activities for loans and other financial services offered by the Farm Credit Corporation.
- Encourage foreign investment and strategic alliances through Canada's embassies and posts abroad through the Investment Inflow Program.

6.10 • Communications

Public awareness and understanding of aquaculture is critical to creating an environment in which the industry can flourish. Communication enhances the ability of the aquaculture sector to successfully mesh into community life. Public awareness is also vital in reducing user group conflict.

The Federal Government Will:

- Develop an Aquaculture Communications Plan to support the implementation of the Federal Aquaculture Development Strategy, and aquaculture in general.
- Liaise with trade and mainstream media to promote aquaculture as a viable sector of the Canadian seafood industry.
- Develop communications materials to help reduce and mitigate user group conflicts and enhance awareness of the social and economic benefits of aquaculture at the community level.
- Harmonize federal communications initiatives with industry and provincial/territorial activities.

6.11 • Performance Measurement and Improvement

An important element of successful implementation of the Strategy will be a monitoring process that ensures that goals are met quickly and efficiently. The federal government needs a consistent flow of information to ensure that the Strategy remains responsive and effective. Industry, for its part, requires feedback to ensure that it is on the best course for success. Performance indicators which reflect real value to the stakeholders, and which can be measured and evaluated, are needed. The evaluation system must reflect the unique characteristics of the aquaculture sector, and the challenges that lay ahead. The system will need to be refined in progress, and the participation of all stakeholders in this aspect of the Strategy is critical.

The Federal Government Will:

- Establish and implement a performance measurement/improvement system that provides data on the state of the aquaculture industry, and the effectiveness of the Federal Aquaculture Development Strategy.



7.0 • IMPLEMENTATION STRUCTURE

Stakeholders share a common vision for the Canadian aquaculture sector at the end of this century. We have quantified the economic and employment opportunities that aquaculture can offer Canada, and have also identified the factors that will be critical to the realization of this potential. The implementation structure for the Federal Aquaculture Development Strategy is designed to facilitate the full and sustainable development of Canada’s aquaculture industry. Figure 7 illustrates the Strategy’s coordination and implementation mechanisms.

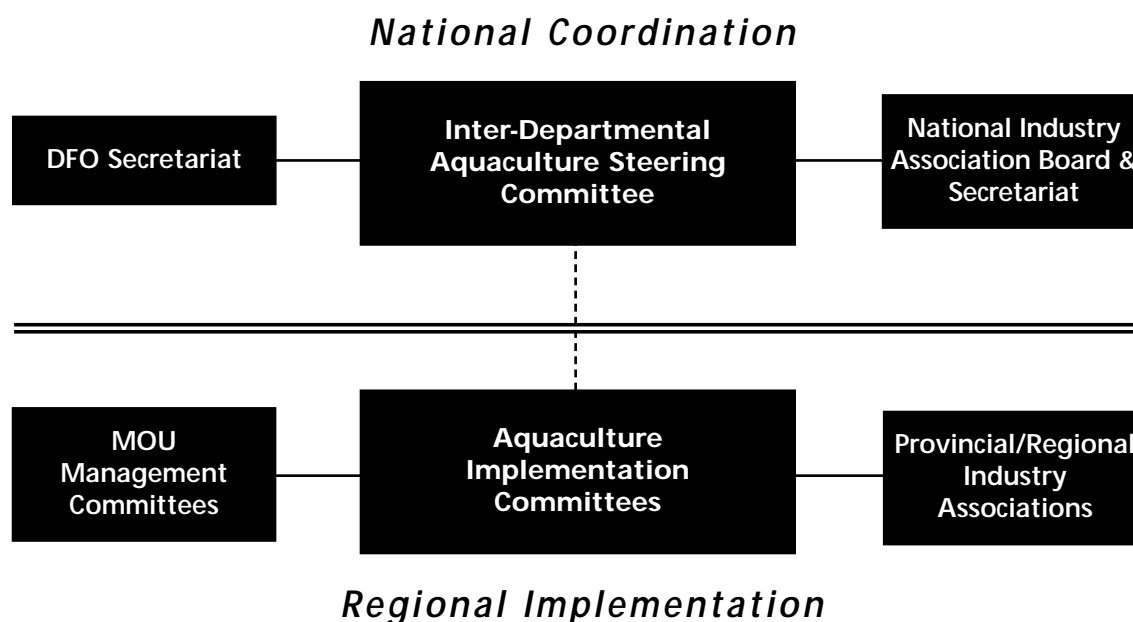
The implementation structure for the Strategy has been designed to:

- maximize flexibility to remain up-to-date and responsive;
- provide clarity and simplicity;
- minimize bureaucracy;

- use established committees, where appropriate;
- allow for adequate industry involvement;
- recognize established lead agency roles; and
- maintain Ministerial responsibilities.

The core implementation teams for the Federal Aquaculture Development Strategy are the industry-government **Aquaculture Implementation Committees (AICs)**. These provincially- and territorially-based, committees will have representation from industry associations, academia and all relevant federal, provincial and territorial agencies and departments. They will work cooperatively to define developmental problems, and to quickly assemble the expertise, technology and resources needed to produce solutions. The committees will be structured to provide equitable footing to industry, academia and government. Support and secretariat

FIGURE 7 • Implementation & Coordination Structure



functions for the AICs will be provided through the established federal-provincial Aquaculture MOU Committees, where they exist. (Where they do not exist, federal and provincial lead agencies will cooperate to provide secretariat functions.)

Committee procedures will be collectively established in a nationally consistent manner, paying particular attention to local/regional circumstances. Regional decentralization is critical to effective implementation. The committees will forward coordinated recommendations for action to the appropriate agencies.

The link between Ottawa and the AICs will be the **Interdepartmental Aquaculture Steering Committee (IASC)**. The Steering Committee will provide national coordination and ensure the integrity of departmental policies and programs. Support and secretariat functions will be provided by the Department of Fisheries and Oceans in accordance with its federal lead agency role. Members of the IASC will be responsible for their department's programs, and will report to their respective Deputy Ministers and Ministers. Ministers will continue to reserve ultimate decision-making authority.

The network of regional/provincial industry associations is the prerogative of industry. It will continue to be nationally coordinated through the Canadian Aquaculture Producers' Council (CAPC). Continuity should be maintained by ensuring that each industry association is represented on the AICs and the CAPC Board of Directors. National and regional industry associations will be responsible for providing their own support and secretariat functions. Industry will, of course, retain its prerogative to consult and lobby at all levels.



7.1 • Lead Agency Role of the Department of Fisheries and Oceans

The Department of Fisheries and Oceans has both a functional role to manage fishery and ocean resources and a lead role to coordinate federal activities related to aquaculture.

DFO's functional responsibility is to manage

the utilization of Canada's aquatic resources in an economically and ecologically sustainable manner. This balance between conservation and development, which is critical to the sustainability of Canada's aquatic resource industries, can most effectively be achieved through the coordinated management of functional responsibilities within the Department.

As the lead agency for aquaculture, DFO will encourage the development of a federal policy, program, and regulatory environment that is complementary to industry and provincial/territorial initiatives. The Department will coordinate the aquaculture-related activities of all federal departments in order to maximize efficiency and minimize duplication. The Department is committed to working with its federal partners in promoting and facilitating the sustainable development of the aquaculture industry in Canada.

There are four principal components to the Department of Fisheries and Oceans' lead role:

1. Coordination:

- Chair federal inter-agency meetings to enhance communication and cooperation among federal departments and agencies.
- Harmonize Canada's work in aquaculture with international standards and protocols, particularly in regard to product safety and inspection.

2. Policy:

- Coordinate federal policy on issues pertinent to aquaculture.
- Promote the development of a harmonized federal regulatory framework.

3. Advocacy:

- Advocate the sustainable development of aquaculture in Canada.
- Promote industry interests and perspectives to other federal departments and agencies.

4. Liaison:

- Promote increased dialogue and communication between all stakeholders.

For further information:

Department of Fisheries and Oceans
Aquaculture Division
200 Kent Street, 11th floor
Ottawa, Ontario
K1A 0E6

Tel.: (613) 993-1820

Fax: (613) 990-9574

