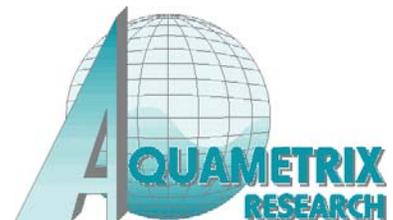


Aboriginal Aquaculture Association

Improving Access to Aquatic Resources for First Nations



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Aquaculture
Association



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1.0 INTRODUCTION

This project was requested by the Aboriginal Aquaculture Association (AAA) and was intended to provide a document that presents a concise summary of the constraints facing First Nations in identifying and developing aquaculture opportunities within their traditional coastal territories.

The purpose of this project was to examine the current policy and regulatory framework for aquaculture development, as it specifically relates to First Nations, in coastal British Columbia. Critical components in the process, including Federal, Provincial, Local/Regional regulatory and resource stakeholders approvals/reviews were to be documented to illustrate proponent requirements and from this to identify specific areas where operational ‘bottlenecks’ currently limit success in First Nation proponents applications for access to aquaculture opportunities. In addition to delimiting process (policy and/or regulatory) constraints, this project was also to list the various logistical issues that are considered obstacles to First Nation participation in the aquaculture industry.

With a clear understanding of the issues that currently constrain First Nations from fully participating in the aquaculture industry, this document was also to provide recommendations for improving the current process by offering new ideas for identifying and using/managing territorial resources suitable for a wide range of aquaculture development opportunities.

2.0 CONSTRAINTS TO FIRST NATIONS

This section of the document outlines some of the key constraints that First Nation proponents face in considering aquaculture as a viable business opportunity within their traditional coastal territories. The components of these limitations comprise physical access to sites, proponent understanding of the tenure application process, policy and/or regulatory constraints, access to working capital, and sector-specific training capacity.

2.1 Access to Sites

The British Columbia government has negotiated a Memorandum of Understanding (MOU) with many of the coastal First Nations, the nature of which has identified and delimited areas within traditional territorial waters that will remain for the exclusive use of the signatory nations for shellfish aquaculture purposes – typically beach culture (clam) opportunities. Initiated in 1998 this process was introduced to all coastal First Nations, soliciting participation in a planning exercise with Provincial government representatives that would allow specific areas within their respective territories to be identified and set aside for

development purposes. Those Bands that expressed interest in such opportunities were provided with Provincial information (including maps) that summarized shellfish culture capability for each of their respective territories. Specific areas that these groups wanted to consider for aquaculture government were identified, and set aside under a Lands Act Reserve for a period of approximately 10 years; this process essentially marked the sites within the BC Lands database so that no other proponent could apply and inadvertently be offered tenures for development of these areas. While these specific areas were, and are being made available to these First Nations through this MOU process, the specific site tenures must be applied for through the established application process (see the 2006 *Getting Started* document).

As of December/2005 a total of 18 coastal First Nations have been involved with this Provincial MOU process for shellfish aquaculture, comprised of the following Bands:

Chemainus	Quatsino
Comox	Sliammon
Ehattesaht	Snuneymux
Halalt	Tla-o-qui-aht
Huu-ay-aht	Toquaht
Ka:'yu:'k't'h/che:k:tes7et'h	Tseshah
Klahoose	T'souke
Mowachaht/Muchalaht	Uchucklesaht
Nuchalaht	Ucluelet

A total of 1,049 hectares have been identified (and reserved) for shellfish applications as part of this MOU process, with 460 hectares converted to shellfish tenures for development purposes. These tenured development areas range from small sites of 2.7 hectares to areas of over 80.8 hectares. The established MOU's can be amended, and provide exclusive rights to the First Nation to apply for tenures in these identified areas.

Although these MOU agreements identify foreshore (deepwater) and beach opportunities for shellfish, there are considerably more diverse opportunities for aquaculture in the protected deepwater regions of most territorial waters. A full appreciation of aquaculture potential, including the wide variety of species that are currently cultured, or are being considered for such ventures (e.g., fish, urchins, kelps, sea cucumbers, abalone, geoducks, etc.) is required of this process.

2.2 Tenure Application Process

The 2006 *Getting Started* document provides a review of the steps that First Nation proponents need to consider in applying for an aquaculture tenure, in preparing a development plan for each site, and the business considerations in starting and operating an aquaculture venture. The application for an aquaculture

tenure is typically perceived as a very complicated process, and one that requires considerable information in support of the proposed development – this in itself can represent a significant deterrent to many individuals who might otherwise want to consider applying.

The nature of the information required for a tenure application will be determined by the species selected for culture, the associated operational (production levels and infrastructure proposed), and the associated (potential) environmental risks related to the proposed development. For example, while an application for a clam beach tenure might require a description of the physical characteristics of the beach (slope, substrate, exposure to weather), the resident biological populations (current levels of clams, presence of eelgrass, predators), and detailed development plans, the information required to assess a proposed finfish aquaculture facility will include detailed hydrographic and physiographic data (tidal flows, bathymetry), an inventory of all habitat within and hundreds of metres of the proposed development, computer modeling of organic waste losses from the facility, etc. It is clear that the differences in information requirements associated with the choice of culture species will also determine the cost of this component of the process, i.e., whether the proponent can acquire and submit these data, or the services of a third-party (with specialized expertise and equipment) will need to be retained in order to complete the required tasks.

To visualize how (and by whom) this information is reviewed and assessed, the proponent submission and referral process is presented in Figure 1. Definitions for the terms associated with the various acronyms presented in Figure 1 are shown in the following table

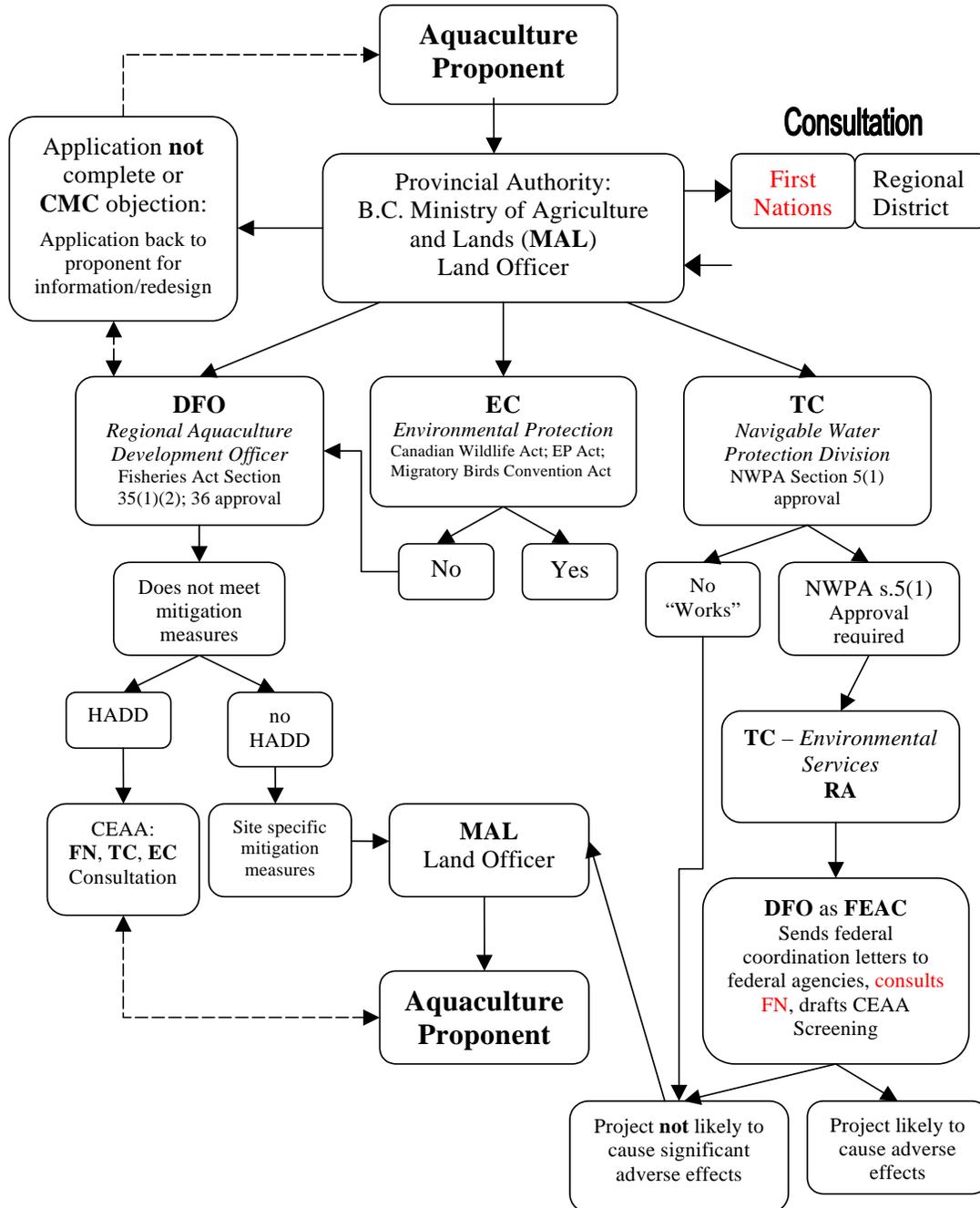
Table 1

Definitions of terms shown within the process flow-chart (Figure 1).

Aquaculture Proponent	individual or Band applying for an aquaculture tenure
MAL	Ministry of Agriculture and Lands
DFO	Department of Fisheries and Oceans
CMC	Council of Marine Carriers
EC	Environment Canada
TC	Transport Canada (Canadian Coast Guard)
CEAA	Canadian Environmental Assessment Act
HADD	Harmful Alteration, Disruption or Destruction of marine fish or fish habitat (Federal Fisheries Act)
FN	First Nation Band within which the proposed development will occur
NWPA	Navigable Waters Protection Act
FEAC	Federal Environmental Assessment Coordinator
RA	Responsible Authority under the CEAA

Figure 1

Application referral process for British Columbia shellfish aquaculture proponents (similar for all other aquaculture applications). The current stages at which First Nation consultation is required are shown in red.



2.3 Policy and/or Regulatory Constraints

There are many Federal and Provincial policies/regulations associated with aquaculture, and some currently represent a constraint to the development of aquaculture opportunities for coastal First Nations. While much of the aquaculture regulation development and/or reform has focused on the finfish sector, primarily given the real/perceived environmental issues associated with these operations, the anticipated (and desired) growth of the shellfish industry sector remains constrained by the comparatively slow reform in its regulatory framework. Given the desire of the majority of coastal First Nations to explore opportunities in this sector, the need to resolve these constraints through appropriate regulatory reform is critical to ensuring the success of these coastal communities in capitalizing on such development opportunities.

Canadian Shellfish Sanitation Program (CSSP)

Growing Water Classification and ongoing testing (biotoxin and sanitary survey programs) is necessary for the commercial development, harvesting and sale of shellfish. Without these programs in place prior to commercial culture, it is not possible to harvest, sell or export shellfish. Although these survey programs are paid for by the federal government, in established (south coast) areas, they have not been fully funded in remote coastal regions of the Province (e.g., Central and North Coasts). Given the potential (and interest) of First Nations shellfish development in these regions the implications of this regulatory constraint are considerable.

The water quality monitoring requirements of the CSSP is also out-dated, requiring analyses of surface waters in order to classify near-surface shellfish developments (beach, raft culture). However, given the move towards deepwater species such as goeduck and scallops, this component of the CSSP is now becoming of critical concern to such operations that are being proposed, and denied, based upon such results.

Developing New Aquaculture Species

Most coastal First Nations do not support aquaculture given the use of introduced species (e.g., Atlantic salmon). Ideally, the development of new aquaculture facilities given the use of indigenous species, and those of particular relevance to native food fisheries, would be the most attractive. The potential use of exotic coastal species such as rock cod, abalone, goeduck, cockles, urchin and sea cucumber has been noted as high-valued aquaculture candidates of interest to many First nations.

Approvals for the culture of many of these species can not currently be secured, and the need to encourage R&D programs/projects that demonstrates the technical

and economic viability of such species is required. Regulatory constraints for such development must be addressed, and the conflicts with competing resource users (e.g., UHA with goeducks) must be resolved.

2.4 Access to Working Capital

The issue of working capital, and investment, is an issue with any business development and is certainly an issue of concern with respect to First Nation aquaculture proponents. While some government support may be realized, commercial-scale project development will typically require outside expertise and investment to grow. Given that many coastal First Nations are inexperienced in regard to the business skills required to solicit and manage investment capital, this deficiency represents an additional constraint to the development and successful operation of an aquaculture facility.

Training in business skills and structure, as suggested below, will provide partial resolution to this inherent inexperience in acquiring and maintaining working capital. A current limitation in the ability to develop effective collaborative partnerships, joint ventures, or cooperatives, could also be viewed as an outstanding issue constraining the acquisition of the appropriate level of working capital (recognizing and building upon economies of scale). Development of partnerships with parties from outside of the First Nation could be an important and effective way to attract investment, manage cash flow/debt, lower operational costs (shared transportation, processing, marketing), reduce financial/market supply risks, and transfer/upgrade technology – all to develop and to sustain an economically viable aquaculture project. An understanding and appreciation of joint venture arrangements may currently be missing yet is clearly required.

2.5 Training Capacity

Training has been recognized as a constraint to the range of aquaculture development opportunities for coastal First Nations. Lack of experience and technical expertise in aquaculture, as well as a lack of understanding of business management skills, will jointly lead to human resource capacity issues and hence the need for relevant training requirements.

Technical Skills:

There is a wide range of technical skills associated with the aquaculture industry and coastal First Nations have recognized their limitations in terms of this expertise in many of these areas. Given that aquaculture development opportunities span not only traditional shellfish species, but include finfish production sites, kelp farms, exotic species (e.g., abalone) facilities, hatcheries, and processing plants, the technical training is equally diverse and with varying degrees of complexity in the skills needed to be successful in that sector.

While training programs have been developed in a number of institutions (e.g., Malaspina University-College, North Island College) these programs, for the most part, are conducted on-campus (linked to industry sites) and over a number of years. First Nations prefer the on-site approach to training, and hence any training initiatives requiring re-location or substantial off-site residency are seen as further constraints to acquiring the required skill sets for aquaculture development.

Business Skills:

Limited experience and expertise (skills) in the management of a business is a critical constraint to development of a successful aquaculture operation. Training in all aspects of business management, including Business Planning, selecting useful business models (e.g., joint venture partnerships), accessing capital, marketing, cash flow and debt management, personnel management, subcontracting, sales and marketing, product branding, promotion, value-added etc. are important to business development and likely represent a significant constraint to most First Nations that are currently considering pursuing an aquaculture development opportunity.

2.6 First Nation Community Issues

It is generally difficult for motivated First nation aquaculture proponents to gain the support of their Council and their community at large. The need for ‘*guaranteed*’ profits is a difficult condition to replace with ‘*minimal risk*’, yet one that is readily acceptable (and common) in a business environment. Community support can be polarized within First Nations, often around issues of food and ceremonial fisheries versus aquaculture production. A clear recognition of the differences, a balanced use of these resources, and training of future generations in local schools will soon alleviate these constraints to aquaculture development acceptance.

Other community (social) issues that currently represent development constraints but could, over time, be resolved as aquaculture development occurs, is supported and hence sustained, includes:

- Employee (band member) commitment, motivation, retention, and substance abuse problems; and
- Product poaching – separating traditional ceremonial harvesting from dedicated farming ground – need for Council and community support – education;

3.0 IMPROVING RESOURCE ACCESS

A variety of development constraints have been identified as a result of the review completed with respect to First Nation access to resources for the purpose of pursuing aquaculture opportunities in coastal British Columbia. While none are considered prohibitive, they can and do represent significant hurdles in terms of acquiring *timely* access to these resources and hence a deterrent (frustration) to a First Nation proponent who expresses interest in such an aquaculture venture.

The following sections provide a number of ideas that represent short and/or long-term solutions (or action items) to address these inherent developmental constraints. These are, essentially, things to consider in organizing and implementing the successful development of an aboriginal aquaculture industry, and jointly comprise a simple 3-tiered approach to address these constraints as they relate to the:

- Individual First Nation aquaculture proponent;
- Coastal First Nation territorial region; and the
- Aboriginal coordinating body for aquaculture development.

The following **concept** represents a holistic approach to *managing* the aquaculture opportunities available to each coastal First Nation in British Columbia. Individually, the components of this approach offer options that could be employed to reduce, or eliminate, the current constraints to timely (and assured) access to aquaculture development for First Nations in the Province by: (i) Identifying Aquaculture Opportunities; (ii) Managing these Aquaculture Opportunities; (iii) Working Effectively with Government; and (iv) Building Developing Capacity.

3.1 Identifying the Opportunity

As environmental stewards of their own resources, First Nations must take the lead on *identifying* the specific opportunities that exist within their territories for aquaculture purposes. This type of territorial initiative will allow delimitation of sites specifically capable for supporting various types of aquaculture (e.g., salmon, other finfish, oysters, scallops, mussels, clams, kelps, abalone, urchins, etc.) and hence the information with which to *manage* these resources according to the principles and/or the philosophy of the local people (e.g., Council, Hereditary Chiefs, Band members, community at-large).

To develop an appropriate understanding of the aquaculture development potential of each coastal region (First Nation territory), and to ensure that any subsequent operations within these regions do not represent a conflict with the traditional values and/or resource uses of the territorial First Nation, the first stage in developing an effective management framework for Aboriginal Aquaculture is to initiate a *process* for identifying the specific aquaculture opportunities that inherently embodied within the natural resources of each First Nation territory. An aquaculture opportunities identification process is described in the following sections, providing a generic technical approach and indicating the inherent value

that such an approach would offer coastal First Nations not only for identifying aquaculture opportunities for development or management purposes, but for use in Treaty negotiations, other coastal development planning initiatives (e.g., tourism), etc.

The implementation of such capability surveys could be costly, and would certainly require specialized expertise to work with individual First Nations to complete. The Aboriginal Aquaculture Association could serve as a coordinating body for such programs, providing an interface between individual First Nations and government funding agencies to acquire and manage the resources need to complete this process.

Resource Inventory

This process component would compile all available information on the aquatic resources of each First Nation territory. Provincial and Federal government archives could be accessed to acquire much of these data, with the resulting information catalogued in a customized Resource Database (with possible Geographical Information System (GIS) interface) for the region or territory under investigation.

Resources of interest to this database development comprise all fisheries, including but not limited to salmon (returns to each river system; Area Catch statistics), rockfish, urchin, prawn, sea cucumber, and clams. The geographical areas that are used for each of these fisheries would also be delimited and used in the development of the Aquatic Resources Management GIS and database interface for Band management purposes. Other biological data to be compiled would include locations of kelp forests, eelgrass meadows, wildlife use areas (adjacent upland; marine mammal haulouts), etc.

In addition to the biological resources of the territory, this process component might also identify physical attributes of the area, including bathymetry, location/size and substrate composition of each beach, each river/stream (and associated discharge characteristics), weather, exposure data, etc. These physiographic data are important factors to delimiting potential areas for aquaculture purposes – both in terms of avoiding sensitive habitats, and for selecting areas suited/capable of supporting each type of mariculture proposed within the territory.

Identification of Aquaculture Development Opportunities

The second component of the process would delimit all of the specific sites available within the First Nation territory considered appropriate for aquaculture purposes. The sites might include those suitable and capable of culturing salmon, black cod (sablefish), Manila clams, mussels, oysters, scallops, and selected ‘new’ aquaculture species such as cockles, kelps, abalone, or geoducks.

The specific sites would be identified and each surveyed for habitat values (field assessment) to ensure that the proposed use would not be in conflict with any traditional resource use, valued cultural, or critical fisheries habitat. This component of the project would comprise detailed *intertidal assessments* of all beaches identified as appropriate for bivalve culture (clams, oysters) as well as the adjacent littoral habitats that may be too close to particular deepwater aquaculture opportunities (e.g., salmon, black cod). For the potential deepwater developments (scallops, mussels, finfish, geoducks, etc.), the identified sites would be surveyed by diver or other means (such as Remote Operated Vehicle - ROV) to delimit the habitat characteristics of each of these specific sites.

Once the identified sites were finalized (no habitat/fisheries conflicts), the sites might be further assessed in terms of the production capability. For this stage of the process the infrastructure configuration (number of lines, culture units, netcages, anchor system, etc.) would be estimated, and the required tenure boundaries proposed for each of these commercial-scale aquaculture site. Results of these data would be transferred and incorporated into the Aquatic Resources Management GIS and mapped for each coastal First Nation territory.

3.2 Managing the Opportunity

It is assumed that the information logged within an established Aquatic Resources Management GIS/database would allow effective management of the aquaculture within each First Nation territory. The overall potential of the area could be readily assessed using this system to: (i) provide an accurate estimation of the potential shellfish, finfish, kelp, and other species productivity for the territory; (ii) identify and develop the best sites for aquaculture opportunities preferred of Band members; and to (iii) establish protocols for the tenuring of remaining sites to other parties interested in developing ‘acceptable’ aquaculture uses within each of the territories.

The move forward from identifying aquaculture opportunities to development and/or management of this potential would require initiation of an *Aquatic Resources Management* framework specific to the aquaculture potential identified within each territory. Options for managing the identified aquaculture production potential, and all of the available sites/tenures within the territory, could also be considered given the likelihood that the development potential in most territories will far outweigh the ability (or desire) of the First Nation community to fully capitalize on that potential.

The Aquatic Resources Management framework within each territorial might therefore be used to control the extent to which these areas are developed, including what species are considered appropriate and under what specific operational conditions and term (e.g., ACES Program – Aboriginal Certification

of Environmental Sustainability; see Cross & Brackett, 2006). An *Aquaculture Operations Agreement* (AOA) for aquaculture proponents permitted to operate within First Nation territories would be developed to reflect the environmental stewardship expected of proponents operating with the territory, and could also consider the social needs of the First Nation (specific sites retained for their use; condition of direct and indirect employment opportunities), etc.

The structure of an Aquatic Resources management framework, and associated *Aquaculture Operations Agreement*, would be developed in direct consultation with Band Council, and thus reflect all of the issues of aboriginal rights, working partnership agreements, etc. Consultation (and potential co-management of such a framework) with the Provincial and Federal government agencies would ensure that the developed strategy conforms to the critical components of the current review and referral processes of these governments.

3.3 Working Effectively with Governments

One of the critical factors in ensuring that coastal First Nations have adequate and unimpeded access to sites within their traditional territories, specifically for aquaculture purposes, is to develop a clear and effective working relationship with government agencies/departments/ministries involved in the management of this industry sector. Improvements to the relationship between coastal First Nations and the governments responsible for aquaculture development and regulation could be realized through consideration of the: (i) potential for developing an aquaculture co-management framework; (ii) recognition of jurisdiction – discrete territories – and integration of area-specific values/issues; and the (iii) potential for revenue sharing and cost-recovery for managing these resources/operations.

Potential for Aquaculture Co-Management ?

Building upon the above model of Territorial Management of aquatic resources, including pre-assignment of aquaculture sites (*Aquatic Resources Management Database*) and establishing territory-specific operational conditions for proponents (*Aquaculture Operations Agreement*), the co-management of these opportunities in coastal British Columbia becomes a viable option that could resolve many of the issues associated with current access to resources by First nations. An appropriate aquaculture co-management framework also provides additional control over potential conflicts between aquaculture development and aquatic resources important to First Nation tradition and values, and a degree of certainty in site development opportunities (pre-determined) to the industry sector as a whole.

An Aquaculture Co-Management framework could be developed to effectively bridge the proposed territory-based management process (site and resources identification; site development and management) with the current Federal-

Provincial site application and regulatory process. A First Nation that has, for example, identified all of the available (and acceptable) aquaculture opportunities that exist within its territory, and has selected those that it wishes to pursue for its own membership, will have (by default) completed all of the present government requirements for First Nation consultation. Further, if the initial site identification procedure (Section 4.1, above) has considered not only First nation criteria for protecting environmental sensitivities (e.g., traditional fisheries, cultural values), but those of Federal and Provincial governments (e.g., fish, fish habitat), then the available sites identified within the territory would already comply with all site criteria of a joint review process.

In essence, a co-management framework such as this, implemented on a territory-specific basis, would alleviate most of the resource access issues experienced by both aboriginal and non-aboriginal proponents. In this model, each territorial government would determine (reasonably and objectively) what specific opportunities exist within their territory, and these would be the only (pre-approved) considered for aquaculture development. A co-management agreement between each First Nation and the Federal-Provincial governments would support this process, assuming that criteria from all parties have been adequately addressed in the initial *aquaculture opportunity identification* stage.

An effective aquaculture co-management framework would also extend to the operational aspects of approved aquaculture facilities. The Aboriginal Certification of Environmental Sustainability (ACES) Program, proposed by Cross and Brackett (2006), has been structured so as to build upon existing industry sector codes, regulatory compliance frameworks, and individual corporate management commitments. The ACES Program recognizes these requirements as a valuable source of *environmental performance* information and hence represents a system by which regional First Nations can integrate their specific sustainability criteria into this existing structure and thereby take advantage of the associated compliance monitoring. A requirement to subscribe to the specific conditions of the ACES Program could further reduce any inter-governmental process ‘bottle-necks’ while ensuring that environmental performance criteria for all parties are adhered to.

Revenue Sharing

The involvement in an aquaculture co-management strategy with both the Federal and Provincial governments will, as stated previously, alleviate many of the current constraints associated with the access to aquatic resources by First Nations. At the same time such a system will identify and offer specific development opportunities that will meet the siting and performance criteria of First Nations and of government regulators, and as a result of the process add business certainty to potential investors or partners for these ventures.

A co-management strategy will, however, be costly to maintain. Although the government partners in such a process are currently well established in terms of infrastructure, employee-base, etc., the involvement of First Nations in the system would require a degree of financial support and management coordination. In terms of the financial component, a shift of fees acquired from the current Provincial Crown tenure and licensing process to assist with the First Nation roles in managing this sector may be appropriate. The application processing and annual rental fees could be used in support of not only system management, but also to facilitate capacity building (training programs) for First Nation participants in the industry sector.

The coordination of the program, to ensure consistency of application among the coastal First Nations (despite individual development options/opportunities), would also provide considerable value to a co-management strategy. The Aboriginal Aquaculture Association may be an appropriate organization for this role, but would require a sufficient budget to maintain program-specific staff, operating expenses, etc. It is unlikely that the tenure and licensing fees alone could support such an initiative, and a separately funded component may need to be considered through the Federal and Provincial partners.

3.4 Development Capacity – Using the Resources

Identification of all of the aquaculture opportunities within a First Nation territory will provide development options that could support a combination of member (FN) and non-member (external) operations, each of which would need to follow the aquaculture co-management development process suggested previously. For First Nation proponents, the actual development of a specific aquaculture opportunity (shellfish, finfish, other) will require a variety of business and technical expertise to start and to operate such a venture. Increasing the ability of First Nation proponents to take full advantage of such opportunities could be accomplished through: (i) provision of Development Support Services; (ii) receiving Access to sufficient Working Capital; (iii) enhancement of Training Capacity; and (iv) Resolution of industry Operational Constraints.

Development Support Services

Whether entering the aquaculture industry through the current Crown Tenure process, or via an improved (and potentially more accessible) system such as that proposed as Aquaculture Co-Management, a First Nation proponent would still require considerable support in terms of site design, species selection, seed/juvenile/smolt sourcing, business planning, market establishment, etc.

Creation of an Aquaculture Development Centre (ADC) within the Aboriginal Aquaculture Association could serve as an effective body with which to provide these targeted services (assistance) to First Nation entrepreneurs. The ADC

would need to be staffed with individuals experienced in the aquaculture development process (technical, operational), as well as with business.

The advantage of developing an ADC lies in its dedicated role of servicing the needs of First Nations, providing the understanding and assistance in dealing with the bureaucracy and business of starting and operating an aquaculture facility. The ADC would represent one component of the Aboriginal Aquaculture Association that would require sustained financial support to maintain, relying upon an annual generated through the proposed revenue sharing (see above), a fixed government allocation, and/or an established fee structure for member First Nation bands or farm operators.

Access to Working Capital

Aquaculture, as with any farming activity, is viewed as an investment with a substantial level of risk and one characterized with a marked delay in establishing a stable cash-flow (related to initial production cycle duration) and hence the potential (and timing) for a return on investment. Despite these inherent business attributes, the selection of appropriate species (in terms of price stability), scale of the farm operation, market location and security, and level of operational costs (given farm location, logistical support costs, staffing) will determine the profit margin for the business and thus the level of risk that the investment community would be willing to entertain (and support).

The key to acquiring access to working capital (operational financing) is in a well-prepared Business Plan. Whether pursuing financial assistance through traditional debt financing methods (banks), joint venture partnerships (another business), venture capitalists (investors), or with specialized institutions such as the Farm Credit Corporation, a clear presentation of the proposed development, including a 5-year projection of the infrastructure requirements, operational costs (e.g., seed, feed, staffing), production levels (and timing), product sales (and markets), and how the requested finances would be used to initiate and sustain the operation until such time as a stable cash-flow is attained. The recommended Aquaculture Development Centre (ADC) of the AAA should be structured to assist with this critical component of the start-up business, as well as providing its First Nation clients with assistance in pursuing the most appropriate investment options.

While a working knowledge of, and access to, these traditional business finance options are clearly beneficial to a First Nation entrepreneur, a need to provide targeted financing programs by Federal and/or Provincial governments may provide the initial ‘push’ to get aboriginal aquaculture started in British Columbia (e.g., north/central coast initiative). Economic Development funding should be made available at a rate that adequately reflects the required start-up costs for an aquaculture operation, but at the same time should comprise not only a grant but a loan program to encourage the serious development proponent.

Training Capacity

A critical aspect of aquaculture development is training capacity. Many First Nations fully realize that they do not currently understand all facets of aquaculture, and that training is an essential requirement if they are to successfully enter this industry sector in either an employee or management role.

The current, and readily apparent training deficiencies that need to be addressed include aspects of:

- Farm Husbandry (culture methods, required infrastructure, grading, harvesting, monitoring);
- Aquatic Health (diagnosing, sampling, treatment);
- Environmental Management (ACES Program, regulatory requirements, monitoring, record-keeping and submission);
- Marketing & Sales (establishing and maintaining product flow); and of
- Business (employee management, taxation, compliance reporting, book-keeping/accounting, purchasing, subcontracting).

While all of these skills can be developed through formal courses offered at a number of coastal institutions, including North Island College and Malaspina University-College, the ability to properly place these educational materials/skills into context and to be able to apply them specifically to the aquaculture opportunity of interest to a First Nation proponent, is to ensure that aquaculture training occurs within the respective territories and are specifically designed to address the needs of the trainees, i.e., focused on the aquaculture type, size, and role of FN participants in these operations (e.g., manager, owner, employee – or all of these positions). On-site delivery of training, whenever possible, will ensure that this capacity is applied directly to the developments proposed by the First Nation participants – in essence, it is suggested that training occur concurrent to the proposed development to further reinforce the application of the required training components.

The Aboriginal Aquaculture Association (AAA) is in a unique position to be able to assist with the development and maintenance of training capacity among its First Nation members. The AAA could help to identify the training requirements *common* to all of its members, to delimit *specialized* training needs for operations specific to a subset of its members, and to facilitate the design, scheduling and delivery of appropriate training initiatives to satisfy these needs. A dedicated *Training Coordinator* may be an appropriate addition to the AAA staff, providing a conduit between the needs of First Nations (whether an individual entrepreneur, a specific First Nation Band/community, or AAA membership wide) and the organizations/institutions that could develop and deliver the required training.

Again, this role would broaden the organizational structure of the AAA and as a result would require an appropriate level of base funding to maintain. However, the role of a *Training Coordinator* position might not be limited to aquaculture, but could provide valuable support to First Nations for building training capacity (linked with aquaculture) in other economic sectors of interest (e.g., tourism). Such a position would provide very valuable, and complementary services to those proposed of the Aquaculture Development Centre (ADC).

Resolution of Development & Operational Constraints

A number of industry-wide development and operational issues have been identified as constraints to further (and/or timely) aquaculture development in coastal British Columbia, and apply to both aboriginal and non-aboriginal participants in this sector. Resolution of these constraints will require government intervention, but must be addressed in a timely manner so as to allow appropriate access to resources for aquaculture purposes, and to facilitate expansion of the industry sectors (shellfish, finfish) throughout coastal British Columbia.

The specific concerns that have been identified, and certainly ones that will require attention in terms of short and long-term planning, are associated with the shellfish aquaculture sector. Shellfish aquaculture opportunities, whether beach or deepwater approaches, are the most sought-after by coastal First Nations and resolution of any issues that currently limit development (or operational) potential must be given priority. These constraints include, but are not necessarily limited to, the following:

- Shellfish Seed Limitation – current seed sources rely heavily upon the United States (Washington), with hatcheries in Canada limited in terms of seed production capacity. The need to encourage and potentially support the development of new shellfish hatcheries is essential. Consideration of strategic locations for such developments must also be incorporate inot the expansion of this sector, e.g., west coast of Vancouver Island, central/north coasts, Georgia Strait, etc.
- Access to Geoduck Sites - the ability of First Nations to delimit sites specifically in support of geoduck aquaculture should be supported. However, the identified sites should not be subject to the Underwater Harvesters Association (UHA) cleaning out existing stock, but rather allowing these resources to be removed (as required) by the First Nation proponents and thus providing revenues with which to support the start-up funds of an aquaculture operation.
- Species at Risk – the ability to develop abalone aquaculture is highly desirable to many coastal First Nations. However, the inclusion of this animal (and others, such as sturgeon) within the *Species at Risk* classification comes with substantial limitations regarding the ability to

grow and then market such species. A clear process by which access to these species for aquaculture purposes is made available, and an associated regulatory framework that is conducive to business (marketing, sales), is urgently required.

- CSSP Growing Water Classification – As required of the Canadian Shellfish Sanitation Program, Environment Canada classifications of shellfish growing water, based on limited bacteriological sampling surveys, are restricting the ability of First nation to develop shellfish operations (and in fact wild harvest opportunities) in remote coastal regions. The need to develop EC-Certified Laboratories within these remote coastal regions, and to provide adequate sampling effort (and resources), is critical to starting and to sustaining any proposed shellfish operations on the British Columbia coast.

3.5 Summary of Proposed Approach

Figure 2 provides a graphical summary of the proposed Aquaculture Development Strategy for coastal First Nations in British Columbia. This process represents a recommended approach for facilitating access to these aquatic resources for individual First Nations by:

- Pre-determining and cataloguing ‘*acceptable*’ locations for various types aquaculture operations (e.g., shellfish, finfish, kelps, other) in an Aquatic Resources Management database;
- Assisting entrepreneurial First Nations to develop specific aquaculture opportunities (identified through the above process);
- Offering sites that may not be developed by the local First Nations to outside parties, providing that these developments comply to the terms and conditions of an *Aquaculture Operations Agreement* and the criteria associated with the Aboriginal Certification of Environmental Sustainability - ACES Program (see Cross and Brackett, 2006);
- Developing and implementing a First Nations – Government (Federal/Provincial) *Aquaculture Co-Management framework* for these economic opportunities, including provisions for revenue sharing;
- Identifying aquaculture training needs for First Nations, and facilitating development and implementation of these initiatives with appropriate institutions or organizations; and by
- Broadening the operational mandate of the Aboriginal Aquaculture Association (AAA) to include an *Aquaculture Development Centre (ADC)*

that would provide implement the above process components, and in essence provide technical support to First nations to encourage and facilitate their involvement in the aquaculture industry.

Figure 2

Summary of proposed Aquaculture Development Strategy for coastal First Nations. The role of the Aboriginal Aquaculture Association (AAA) in implementing this process to expedite and to manage these aquatic resources is provided along the left side of the proposed process pathway.

