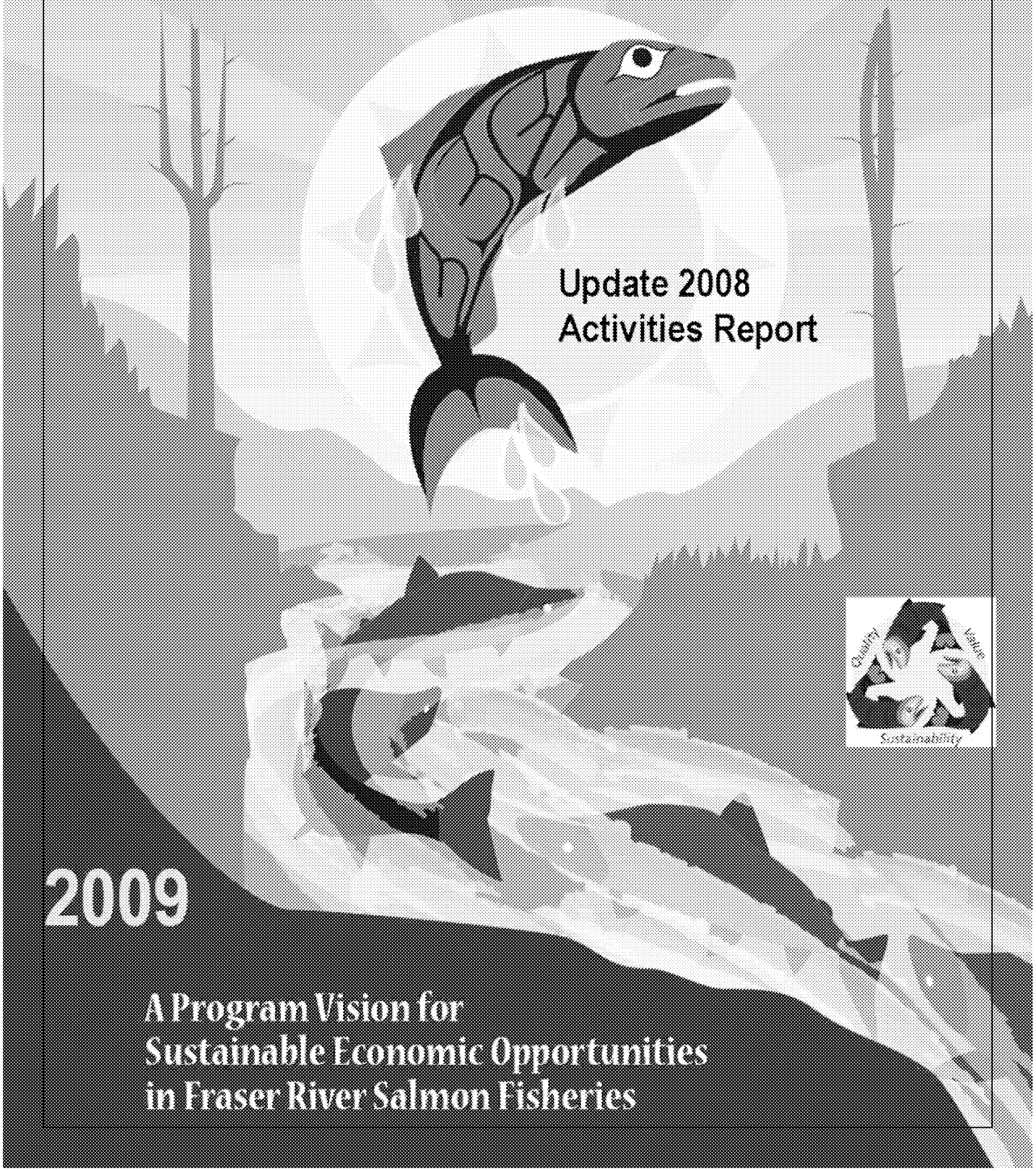
RIVER TO PLATE



Update 2008 Activities Report

Quality Value Sustainability

2009

A Program Vision for Sustainable Economic Opportunities in Fraser River Salmon Fisheries

DFO-68168

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Come gather 'round people,
wherever you roam and admit that the waters around you have grown, and accept it that soon you'll be drenched to the bone.

If your time to you is worth savin', then you better start swimmin', or you'll sink like a stone, for the times they are a-changin'

– Bob Dylan

Acknowledgements

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- Skeena River Fisheries Commission
- *Lheidil-Tenneh* First Nation
- Northern Shuswap Tribal Council
- Upper Fraser River Conservation Alliance
- Lower Fraser Aboriginal Fisheries Management Forum
- *Secwepemc* Fisheries Commission
- Nicola Tribal Association
- Okanagan Nation Alliance
- Siska Indian Band and the Siska Traditions Society
- Skeetchestn Indian Band
- Chehalis First Nation
- Scowlitz First Nation
- *Sto:lo* Tribal Council
- Yale Landing, Everett Hope

Dave Moore[1] facilitated the best practices forums, led drafting of the fisheries management and programming elements in this report, and contributed photographs of the fishery. The Secwepemc Fisheries Commission is also acknowledged for providing photographs of their fishery. Rebecca Robertson[2] led the drafting of food sciences and quality management standards. Original graphic art for this report was provided by Kathy Kebarle[3]. Editing and publishing of the original report was led by Rebecca Robertson. Any errors or omissions are the sole responsibility of the authors.

[1] *Fisheries Development Services, Kamloops*
[2] *What's Next – UBC and BCIT Food Information Services*
[3] *MGDC Design Write Communications. www.design-write.com*

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Preamble

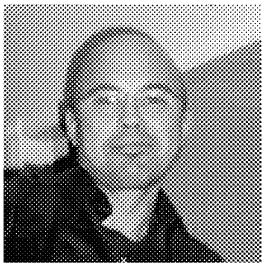
"The future commercial salmon fishery of the Fraser River will be the antithesis of the industrial mixed stock fishery. First Nations are struggling to return their once rich and sustainable livelihood. Those that manage to acquire access and licenses and organize a commercial fishing enterprise, face the final challenge of adapting to the world market-place and economy. The values in the program **Vision** are derived from experience in the Fraser. They will emphasize the distinctive qualities of the salmon, the uniqueness of our fishery, and our rights to once again sustain both healthy and prosperous fishing communities."

Sto:lo Grand Chief Doug Kelly Sto:lo Tribal Council
And Co- Chair, First Nations Fisheries Council

"The river to plate concept presents an opportunity to create an open, honest, and transparent space for the trade of salmon in the Fraser River; it can also heal and transform previously damaged or broken relationships. First Nations in BC are positioning themselves for a remarkable transition that will not only aid in reclaiming their rightful place as the stewards of this valuable resource, but symbolically will also meet the objectives of fisheries reform as well.

First Nations, DFO and the Provincial Governments are pursuing a reformed fishery, built on sustainability and to achieve full economic and social potential from the fishery. The economic opportunities we see out of the future fishery are all about generating public, market, and participant confidence, and are equally about building community self-reliance. The new paradigm shift is well under way. Respect and trust are central to building new relationships in the fishery. *River to Plate* is a First Nations strategy that promises people a place to conduct business with mutual respect for the fish and each other by promoting open and honest communications, collaborative approaches to sustainable fishing and market development, and conflict resolution. Most importantly, it does this with a shared commitment to the ultimate survival of the fish and the people who are inextricably linked to them."

Marcel Shepert
Facilitator/negotiator with FRAFS and Upper Fisheries Conservation Alliance
Fraser Panel member
Pacific Fisheries Resource Conservation Council member
Co-author "Our Place at the Table"



Executive Summary

Business and quality management programming proposed here are considered synonymous in the Fraser River salmon fishery where access and handling of the catch can make or break a fisheries business. The inland fisheries in particular cannot build their businesses on volumes and wholesale fisheries, so they must make the most of quality, value, and sustainability for the benefit of both the fish and the fishing communities. And, they need to be explicit about the incentives for businesses that embrace this emerging vision.

This project was inspired by the efforts of First Nations who are exploring the viability of in-river Fraser salmon fisheries. ***River-to-Plate*** was originally presented as a program Vision in 2008 and has been updated in the spring of 2009 with the results of activities over the last year. It enjoys strong operational support in the experimental or "demonstration" projects, though it has not been formally endorsed by any First Nations beyond those leading the way through these projects. However, every vision starts somewhere and this one acknowledges the important and fundamental lessons learned in these experimental fisheries – some dating back to the 1980's. ***River-to-Plate*** thus introduces the *building-blocks* of a Vision for the Fraser in-river economic salmon fisheries. It will be discussed, refined and tested, and we expect to report back annually on our progress.

The strategies speak to the idea of valuing Fraser Salmon fisheries in the ways espoused in the program Vision – in the way we fish, in the quality of the food produced, and the value of trade environments. Clearly this vision will even transcend public values beyond Aboriginal and economic fisheries. The program mission explicitly addresses the ways to value the fishery that should resonate from the river to the market place. The strategies herein are aligned under 3 goals: ***Sustainability***, ***Quality***, and ***Value***.

Sustainability Strategies 1-3 address ***Sustainability*** and prioritize the over-arching need to meet the FSC needs and to do a better job at managing escapements and other objectives in the Fraser River.

Quality Strategies 4-6 address ***Quality***, and introduces a strategy for a collaborative quality management program for the Fraser River to enhance the economic performance of the fishery, along with a strategy aimed at the quality of the trade environment that will build transparency, stability, and accountability in the whole Fraser salmon fishery.

Value Strategies 7-9 address the goal to increase the ***Value*** of Fraser salmon so that it provides incentives to those who meet the quality standards. Flagship projects include direct marketing with traceability, certification and products research using low-grade salmon meat to combat waste and dumping often associated with the salmon caviar business.

An implementation program is underway, continuing over the next 3 years that recommends investment in a new business minded skill-set, based on sustainability and the quality of the food and trade environment in the Fraser River salmon fishery. The sustainable fishery of the future demands that fishers are trained, tooled and benefit from implementing the ideas contemplated in ***River-to-Plate*** - a Quality Management Program for Fraser River Salmon.

Chapter 1 Transformative Change[4]

According to the UN report on the State of World Fisheries and Aquaculture, over 70% of the world's fish stocks are imperiled, over-capitalized, and over-subscribed, peaking in 1990, driving up prices and food shortages. "W*orld total demand for fish and fishery products is projected to expand by almost 50 million tones... to 10.9 million tonnes by 2015"* and they forecast *"... a global shortage of supply of fish in future"*[5] .

Marine Stewardship Council

Recognizing the state of the global fisheries economy, the Marine Stewardship Council (MSC[7]) is committed to engaging market forces to conserve the world's fisheries. MSC has developed a voluntary certification system and set of standards to encourage sustainable fishing globally. Their *Principles and Criteria for Sustainable Fishing* is based on the *FAO Code of Conduct for Responsible Fisheries.*[8] Canada's Pacific fisheries are currently under independent review as one step towards certification. Fraser River fisheries may contribute significantly to the effort to certify Pacific salmon fisheries.

DFO's Pacific Fisheries Reform

DFO's Vision for the Canadian Pacific Fisheries is based in achieving sustainability, and includes achieving full economic and social potential from the fishery, generating public, market and participant confidence, and self-reliance. DFO's Pacific Fisheries Reform policy highlights a transfer of licensing that supports economic opportunities to engage First Nations in the fishery. DFO has been providing licenses for small "demonstration" fisheries, voluntarily engaging fisheries to explore ways to achieve these objectives.

Since the introduction of DFO's Pacific Fisheries Reform in 2005, projects are being licensed in-river to experiment with commercial viability. Projects are encouraged that are first selective, and then that they reflect inter-First Nation cooperation and collaboration management. DFO is also concerned that new fisheries do not increase the complexity or cost of managing the fishery.

Pacific Integrated Fisheries Initiative (PICFI)

DFO's Pacific Integrated Commercial Fisheries Initiative (PICFI) introduced in 2006 dedicated $175 million to acquire access for First Nations, improve co-management, provide for capacity-building, and to pursue enhanced accountability. To qualify for license transfer, successful applicants are also required to demonstrate economic viability, and their fishing plans must explicitly address conservation needs, and protect the *FSC* non-economic fisheries.

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[4] *Subtitle is drawn from the BC First Nations Action Plan on Fisheries.*
[5] *United Nations Food and Aquaculture 2004.* http://www.fao.org/DOCREP/007/y5600e/y5600e08.htm#P9_1777
[7] See glossary
[8] *FAO Code of Conduct for Responsible Fisheries, October 31, 1995.*

Our Place at the Table (and Beyond)

In 2004, a First Nations Panel Report considered Aboriginal perspectives on post-treaty fisheries in BC, and laid out solutions and recommendations "*aimed at bringing a high degree of certainty to aboriginal and non-aboriginal interests alike, while ensuring the conservation of fisheries resources.*"[9]

In a series of 7 recommendations, the Panel emphasized the priority to ensure that First Nations have adequate quantities of fisheries for food as well as economic purposes. They also recommended that Canada take immediate steps as an interim measure to enter fisheries co-management agreements with First Nations, allocate funding for license access and capacity, and make transfer arrangements of a minimum 50% share of fisheries. They also recommended that First Nations deal with inter-tribal sharing. In 2007, the First Nations Summit, the Union of BC Indian Chiefs and the Assembly of First Nations collaborated to form the BC First Nations Fisheries Council and an action plan to pursue access to sustainable fisheries and to achieve equitable sharing among a range of far reaching strategic actions outlined for the fishery.

BC First Nations Fisheries Council and Action Plan

The First Nations Leadership Council, comprised of representatives from the Union of BC Indian Chiefs, the First Nations Summit and the Assembly of First Nations in the region developed a BC Region *Fisheries Council* an *Action Plan* in 2005. *The Action Plan* was developed to generate a road-map of the key regional issues in fisheries and to scope out the state of affairs and actions.

In their statement of unity, the First Nations endorsement of the Action Plan emphasizes the importance of "Building Solid Economic Opportunities" in a sustainable fishery: "*First Nations in BC recognize the importance of aquatic resources to all First Nations and will work together to develop fisheries management systems that enable sustainable economic opportunities with long-term benefits to First Nations communities and fishers.*"

Figure 1. Weaver Creek sockeye mill before the spawning channel

[9] *Sterritt, Neil J., R. Jones, M. Shepert. May 2004. Our Place at the Table. First Nations Panel Report on Fisheries.*

In the Fraser River

Salmon licenses are being targeted for transfer by DFO. Willing license-holders are compensated for giving up their license to the Crown, which then may disburse the licenses. Overcapitalization in the marine fishery (*too many boats chasing too few fish*) is currently at odds with declining stocks and the restrictions imposed by precautionary fishing. So with fewer marine fishing opportunities, more buyers are willing to give up their licenses. The resulting river fisheries are created in this way at the expense of precautionary marine fisheries and therefore are subject to the same set of conservation rules.

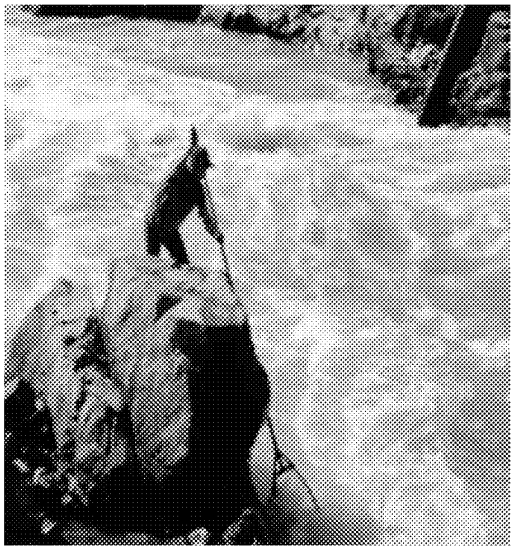

Figure 2. Dipnet fishery on the Chilcotin

The presence of available Total Allowable Catch (TAC) in-river is identified when the target catch can occur effectively, and where by-catch of non-target fish can continue to be minimized. In-season stock assessment data to make these decisions in-river is lacking and these "small bite" fisheries must mobilize with short notice and a significant amount of risk. Insufficient fish arriving in the fishery leads to poor catch success, and then the fishery is in conflict with conservation and FSC non-economic priorities.

It has therefore been in the best interest of First Nations entering the commercial fishing experiments (i.e. demonstration fisheries), that the fishery plan is based in good stock assessment information, and that there is a system in place to ensure that the escapement and non-economic needs have been properly addressed.

Access priorities

Allocating access to Fraser salmon is besieged by at least two clearly distinct management challenges; achieving First Nations FSC priority access, and the need for functional sharing arrangements between First Nations and with other fisheries in-river. The challenge of meeting FSC access when abundance is very low can confound fisheries planners across sectors. DFO policies receive guidance in these matters through both Canadian case law and policy.

The first challenge dealing with priorities of access is addressed today in DFO's Allocation policy (1997). This reflects the priorities outlined in R. v. *Sparrow*[10] that provide a clear framework for sharing in the fishery, beginning with conservation, followed by Aboriginal Food, Social, and Ceremonial purposes (*FSC*). Other uses of the resource are to be allocated after these needs have been met. The court did not give direction in *Sparrow* on whether the "*Social*" purposes included economic rights, and the Supreme Court still grapples with a defensible test.

[10] *SCC R. v. Sparrow, 1990*

The second challenge is about how to address the access priorities and sharing, that can be most tumultuous during periods of low abundance. This challenge perhaps applies to the whole fishery, but is most visible in-river when insufficient escapements will even limit FSC access. Here, the fishery takes it's guidance from the Supreme Court in R. v. Gladstone[11]:

"*…it is understandable that in an exceptional year, when conservation concerns are severe, it will be possible for aboriginal rights holders to be alone allowed to participate in the fishery, while in more ordinary years other users will be allowed to participate in the fishery after the aboriginal rights to fish for food, social and ceremonial purposes have been met.*"

It is difficult to reconcile impacts from a by-catch hundreds of miles away, and many may argue that a reasonable infringement may be accommodated in order to provide a limited opportunity elsewhere. However it is unlikely that a commercial fishery could be prosecuted in the Fraser River in a plan causing clear interference with the FSC priorities.

Economic challenges and opportunities

Perhaps the greatest *economic* challenge in the developing Fraser commercial salmon fishery will to provide fishing access for salmon in sufficient volumes, and with enough predictability to support viable industry in-river.

Currently, *small bite* commercial fisheries are being tested in the Fraser which selectively harvest abundant stocks between the weaker runs. Nearer the spawning grounds and often in the tributaries, fishers are encountering periodical abundances of salmon which have escaped the reduced mixed-stock approach fisheries. The resulting available harvest though comes at poorly forecasted times and volumes. The catch is often in terminal or near-terminal in locations where there is little infrastructure, and the cost of transporting salmon to existing processing plants is quickly lost if the distance is too far, or the quality unsuitable for quick sale.

Licenses are only allocated on the eve of the fishery, with little time to prepare or attract investment. This unstable investment environment is responsible for the proliferation of "middle-men" brokers who make a living through the wholesale trade of fish in-season. In return they take custody control that includes inventory, handling, and quality management, and there is little incentive for local investment or adding value.

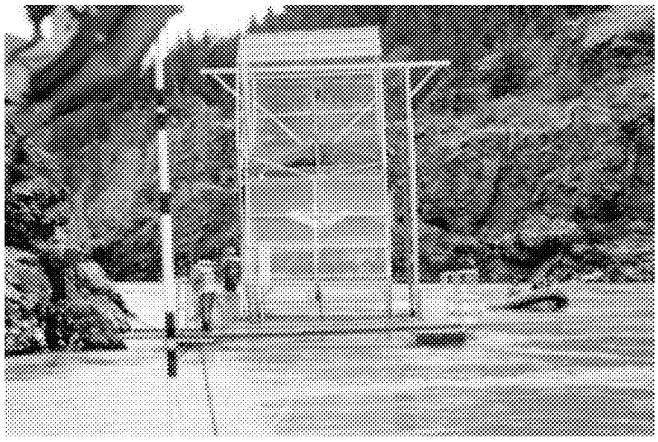

Figure 3. Towing the Siska Fishwheel into place

[11] SCC *R. v. Gladstone, 1996*

*Fraser salmon story – myth or prophesy?**

In a time beyond memory it is told that the Indians of the Fraser River became hungry, for the salmon did not return. So the spirit of Coyote was sent to bring the salmon back. He encountered and destroyed a giant weir blocking the river downstream, and led the salmon home.

As he ascended the Fraser, the salmon followed him in great schools. He lit fires at each tributary as he progressed, beckoning the river people to celebrate each returning stock. And, he reacquainted them with their distinctive ways to catch, prepare, and preserve each salmon run as their ancestors had done before them, so that their people could survive.

He asked for nothing, though he implored of the river natives to protect the salmon runs, and to catch, eat and trade salmon as a celebration of their existence, but to always ensure enough escaped to spawn and feed the people upstream.

It is the endurance of these innovations, often uniquely different between nations and salmon runs, which are testimony to the existence of ancient cultures and knowledge. These rich cultures embody the rich knowledge from time immemorial, vital to the survival of tomorrow's fishery.

Finally, it was said that in a time too far ahead to see, that the Fraser salmon runs would dwindle once more, and the Coyote would return once again to bring back the salmon. Perhaps then, the distinctive customs, innovations and knowledge will still endure as a reminder of the places the Fraser salmon call home.

*Derived from a traditional Secwepemc story *"Coyote Breaks the Dam"*

A little progress has been made during periods of low sockeye abundance from value-adding pink and chum salmon (pre-packaged in sauces etc.), and some work has been done with small numbers of matured sockeye and chinook. A pilot project in 2006 even developed and licensed a system to collect and ship raw eggs from a local micro-processing plant to a coastal caviar processor.[12]

The inland salmon fishery must also address the marketing challenges inherent with the greater variability in species, volume, and quality (moisture and oil content, skin color etc.) that typifies the in-river harvest. Industry has already learned that all five species of Pacific salmon are rich in marketable caviar-quality roe, that the inland catch takes to smoking and drying well, and that there is a largely untapped market for fresh quality salmon products inland.

Infrastructure capital is difficult to obtain and necessary to add value to the inland fishery. Business planning and infrastructure can help by developing landing areas to promote better quality controls, monitoring and traceability (not limited to the Aboriginal fishery). It can also enable regulated sorting, washing and primary processing that will generate more value with a minimum of investment.

Often community producers without in-house capacity (almost everyone inland) must give up custody of catch (and in some cases future catch) to get the help they need just to get the fish to the market. A few of these have persevered with local processing and markets, and even developed their own products. But after exhausting the available local markets, those with additional volume must ultimately struggle against the cost-benefit of absorbing transport costs to existing plants on the coast.

There is a market for processed mature salmon products, and there is always a market for fresh salmon during the brief season. The greatest work ahead will indeed be creating the infrastructure and capacity to make good value of salmon meat near the fishery, and utilizing existing plants and business partners on the coast for the excess.

[12] *Siska 2006*

Underlying regulatory principles of the inland fishery

In 1994, DFO introduced "Pilot Sales" in the lower Fraser River drawing upon licenses as part of their Allocation Transfer Program (ATP). Introduced under AFS[13], the program allowed in-river First Nations to sell a portion of their salmon catch in return for licensing and monitoring conditions. Introduced in 2004, DFO's *Pacific Fisheries Reform* policy emphasizes the objective to increase licensing opportunities that supports additional economic access to First Nations in the BC fishery, including in the Fraser River.

DFO has been providing licenses for small "demonstration" fisheries in-river: several of these demonstration fisheries have been licensed in the Fraser River since 2005 in the Harrison River, the Mid-Fraser, the Thompson and Quesnel River, and on the Fraser near Prince George. Priority has gone to proposals that provide evidence of inter-First Nation cooperation and collaboration, are selective, and do not increase the cost of managing the fishery. They also provide appropriate levels of monitoring and traceability, contribute to in-season stock assessment, and protect the *FSC*[14] fisheries.

The role of food regulators like the BC Fish Inspectors, Regional Health Authorities, and the Canadian Food Inspection Agency begins at the first receiver of the fish (from the fishermen). Picking up where DFO leaves off, the next regulatory role is to address handling standards for the catch in regulation, and licenses that are proof of compliance to this regulation (to quality controls, labeling, and traceability). Licensing systems in this way are explicitly tied to food safety standards that affect the return to the producer. There is an additional potential for producers to adopt and perhaps expand upon standards as the foundation of their business plans, incurring costs and generating values that exceed that of a wholesale fishery. In this way, some new producers are tackling quality branding in business plans that will provide a greater level of market access by managing the quality of the fishery (and by extension the trade environment) as the foundation for qualifying as a sustainable fishery. This is coincidentally the groundwork to meet those qualifications for MSC Certification.

The BC Fish inspection Regulations[15] defines processing as "*cleaning, filleting, icing, packing, canning, freezing, smoking, cooking, pickling, drying, or preparing fish for market in any other manner*. Unprocessed salmon – the un-iced and unsorted catch bought directly from fishermen, is valued as low as 1/5 of the price paid by the consumer.[16] Often, consumers are eager to pay for fresh, graded and washed salmon direct from the fisher. Usually the prices are far below those in the supermarket. However, every fishery is not suited to a processing plant, no more than every fishery is suited to a road-side market. Infrastructure planning for the Fraser salmon fishery is driven by the unique production characteristics at each site.

Therefore, fishers can be engaged in the value chain by providing the tools and infrastructure for local fisheries to initiate "processing" as defined in Provincial regulation – even if that means just sorting and icing the catch. However, this means entering into a myriad of quality control regulations that are critical to maintain quality and a valid license. Examples of the range of licenses for various business models is illustrated in Table 1.

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[13] *AFS – Aboriginal Fisheries Strategy*
[14] *Food, Social and Ceremonial fisheries as defined in Sparrow SCC 1990.*
[15] *BC Reg. 12/78 O.C. 89/78*
[16] *Examples from demonstration and pilot sales fisheries of sockeye in the Fraser River.*

Table 1. Licensing Requirements for Various Business Models in the Inland Fishery

Business Model 	**DFO/First Nation license and designation**	**BC Vending License**	**BC Buying Station License**	**BC Fish Broker License**	**BC Fish Processing License and Inspection(from HA)**	**Inspections: HA(off-reserve)/Health Canada (on-reserve)**	**Federal Registration HACCP (CFIA)**	**Federal Export Certification**	**Labeling & Packaging**	**BC Annual Fish Production Report**
Fisherman to public	X	X								
Fisherman to Broker/ Buyer	X		X							
Fish Broker (no facility)				X						
Buying/Selling Station			X						X	X
Storefront/retail						X			X	X
Storefront with Freezer						X			X	X
Processing Plant					X	X	X	X	X	X

Local sales have been tested in some of the lower Fraser pilot sales as well as in the demonstration fisheries. Successful value-adding of production has come from sorting, icing, packaging and labeling, and providing local alternative to wholesale production. The support required to develop alternative infrastructure is the first incentive to participate in a watershed-wide quality management program. The following general background information is offered as a summary of the existing regulatory maze. A more detailed list of government contacts and information sources was developed as a reference for individual First Nations demonstration projects in the Fraser.[17]

The burden of dealing with less-valuable fish becomes an economic imperative driven by disposal costs. Programming is needed to develop valued products, to build the necessary markets, and systems to acquire the raw materials from distant fisheries even in the headwaters. Many mature Fraser salmon are currently sold for their valued caviar-quality eggs, but are not processed for their meat values due to the poorly developed products and markets. They may be used now for pet-food, given to mink farmers, or simply dumped because of the cost of processing or disposal, and market risk.

An illustrated model for production-based planning has been developed to aid in business planning (Fig.4). The model explicitly ties the quality and value objectives to infrastructure needs as the foundation of business planning.

[17] *Business Planning and Assumptions for Inland Commercial Salmon Fisheries. Produced for Siska, the Secwepemc Fisheries Commission and the Upper Fraser River Conservation Alliance, March 2006.*

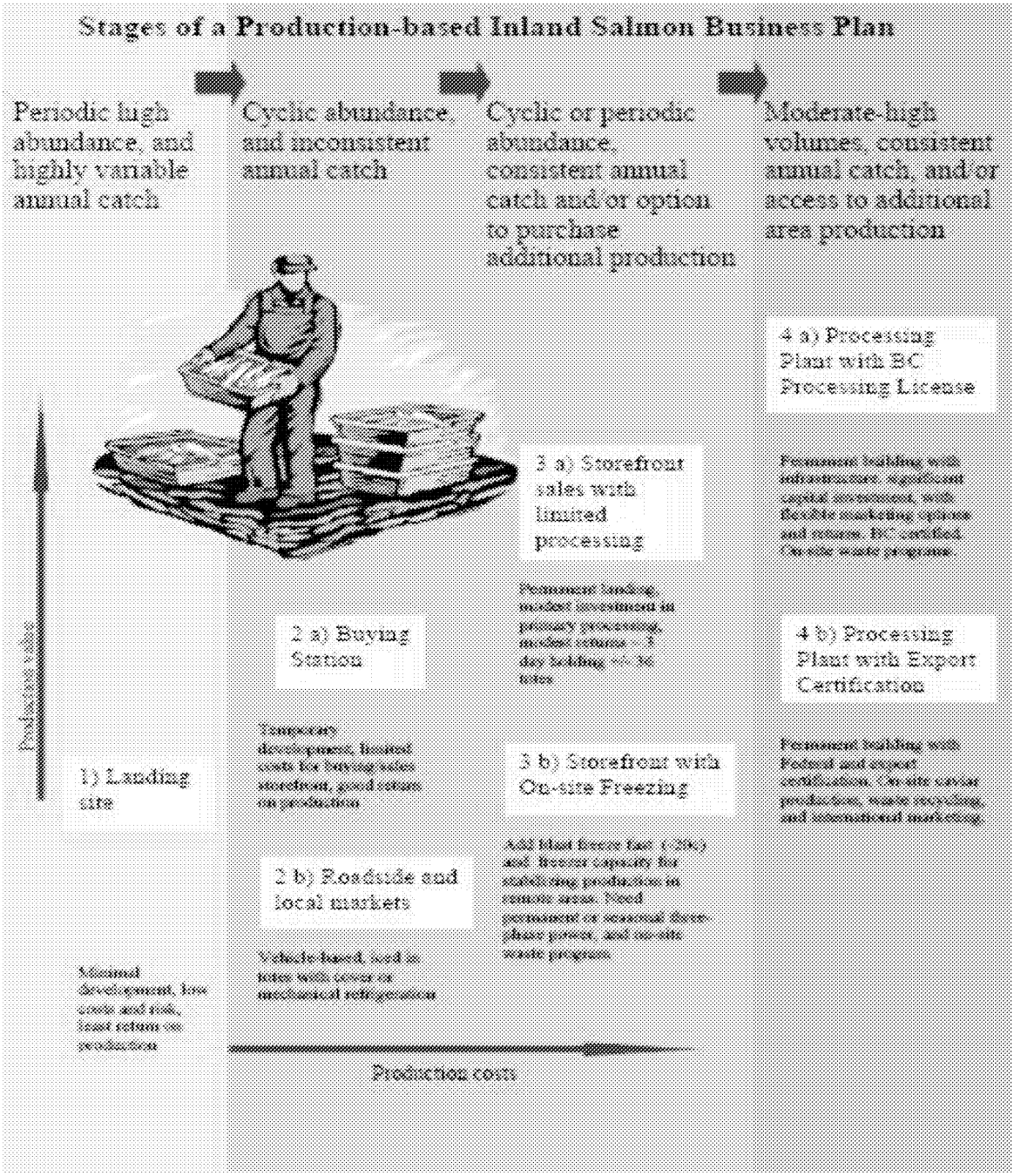


Figure 4. Stages of a Production-based Business Plan

Allocation needs and viable economics of the salmon fishery

Demonstration projects within the Fraser River operate within a thinly mandated objective to experiment with viability. There is no watershed-wide sharing plan, and the policy for allocation among First Nations is unclear, prohibiting the formalization of arrangements, the exception perhaps of those inside the BC Treaty process or some projects in the Fraser that also operate ESSR fisheries.

Therefore, the experimental or "Demonstration" commercial fisheries are unable to progress to stable and predictable allocations for commercial purposes until allocation to other higher priorities (Conservation and FSC) can be better assured. Further First Nations in-river will need to develop a formula and plan for in-river sharing. To date this has been attempted in both the Canada-BC Treaty process and in Tier 1 or inter-tribal processes. Neither of the processes enjoys complete engagement of all Fraser First Nations, and specific conclusions appear illusory.

When Fraser River commercial fisheries have tackled commercialization beyond the lower Fraser "Pilot Sales", they have focused on break-even studies; a rationale for allocation and viable business planning. Conducted in the Harrison River, on the main-stem Fraser near Lytton and Prince George, and on the Shuswap and Quesnel, these studies all struggle with unpredictable opportunities, lack of infrastructure and training. And, with the exception of the *Lheidli T'enneh* First Nation and a small project with the *Secwepemc* Fisheries Commission, the projects have not had access to the most valued sockeye fishery.

All the projects have identified targets to try to achieve viability, however they have not had the opportunity, through DFO licensing or management of downstream fisheries, to get sufficient fish to test their hypothesis. The projects have developed plans with varying degrees of sophistication to get there over the next few years. It is hoped that through programs like *PICFI*, there will be sufficient allocation in "block" or local watershed pilots to support the series of experimental projects to do this in a controlled way while broader and more complex challenges in the fishery are addressed.

Figure 5. A fresh salmon retail outlet piloted at Savona

Some of the more complex challenges in the fishery include making progress with the voluntary buy-back programs, conversion of related catches into shares, transfer and sharing in-river between First Nations and with the sport fishery, and allocation among First Nations and their respective priorities. However, the need for experimentation and viability testing is not at a stand-still in the Fraser.

In collaboration through a best-practices network, and with the help of DFO and BC Fisheries through demonstration projects, the participating Fraser First Nations have tackled the questions of viability through trial and error and generated some basic parameters to plan from. Break-even production thresholds are largely dependent on species, and whether the catch is sold wholesale to the coast, or processed and sold locally. All the projects have determined that they must maximize their local sales

and at the same time maintain a standing business arrangement with coastal facilities with existing infrastructure to uptake excess production when the fishery outstrips local processing and sales capacity. Nobody wants to over-capitalize for seasonal salmon fisheries, and to date, nobody has come up with a satisfactory use for fish plants outside of the fishing season. Therefore, some localized business modeling has emerged that reflects the seasonal nature of these inland fisheries with some basic understanding of local sales capacity and the allocations needed for viability (in sockeye equivalents and recently in Pink salmon equivalents). A profit/loss profile generated from an inter-active planning model developed for the inland fishery[18] predicts break-even thresholds in harvests over 15,000 – 20,000 sockeye.

Greater profits were made where local sales are maximized (> 250 fish daily), and infrastructure has been developed to harvest and ship caviars daily and freeze the catch on-site to extend the local market period (Fig. 6 and 7). When Siska applied a similar model to Pink salmon, it was predicted that the break-even allocation would amount to 3 or 5 times the equivalent sockeye allocation.

Chehalis found the break-even allocation of chum salmon in the order of 35,000 fish. Less work has been done with Chinook, however preliminary work[19] suggests that break-even thresholds would be somewhere in the middle of this.

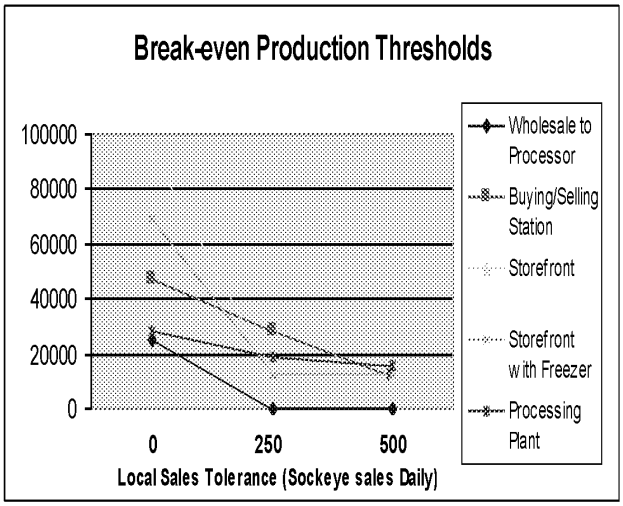


Figure 6. Break-even Production Thresholds

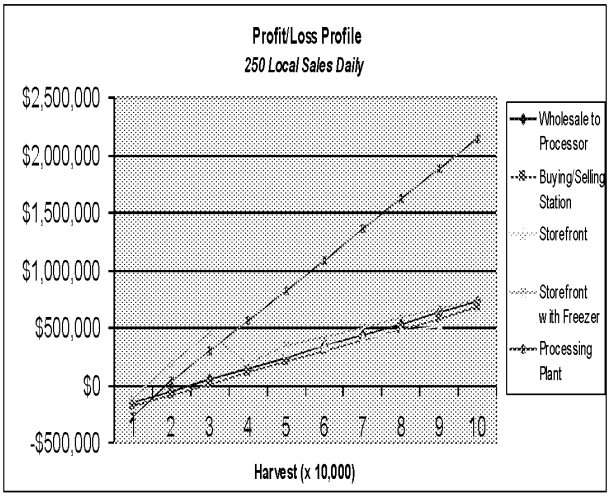


Figure 7. Profit loss profile using sockeye

If these figures are applied to the inland Fraser salmon fishery as a whole, and perhaps up to 5 experimental projects, the annual allocation (if single-species based) would amount to 100,000 sockeye, 100,000 chum (depending upon the number of projects ~ in the lower River only), 500,000 – 600,000 pink salmon, and 20,000 – 25,000 Chinook salmon. A successful inland commercial fishery will need to be capable of handling a mixture of species and be equally adept at valuing their catch regardless of the species and quality composition. Therefore, allocation planning for experimental commercial fisheries in-river would consider a mix of these species in each project.

Photographs by Dave Moore

[18] Moore 2006
[19] Secwpemc Fisheries Commission 2007

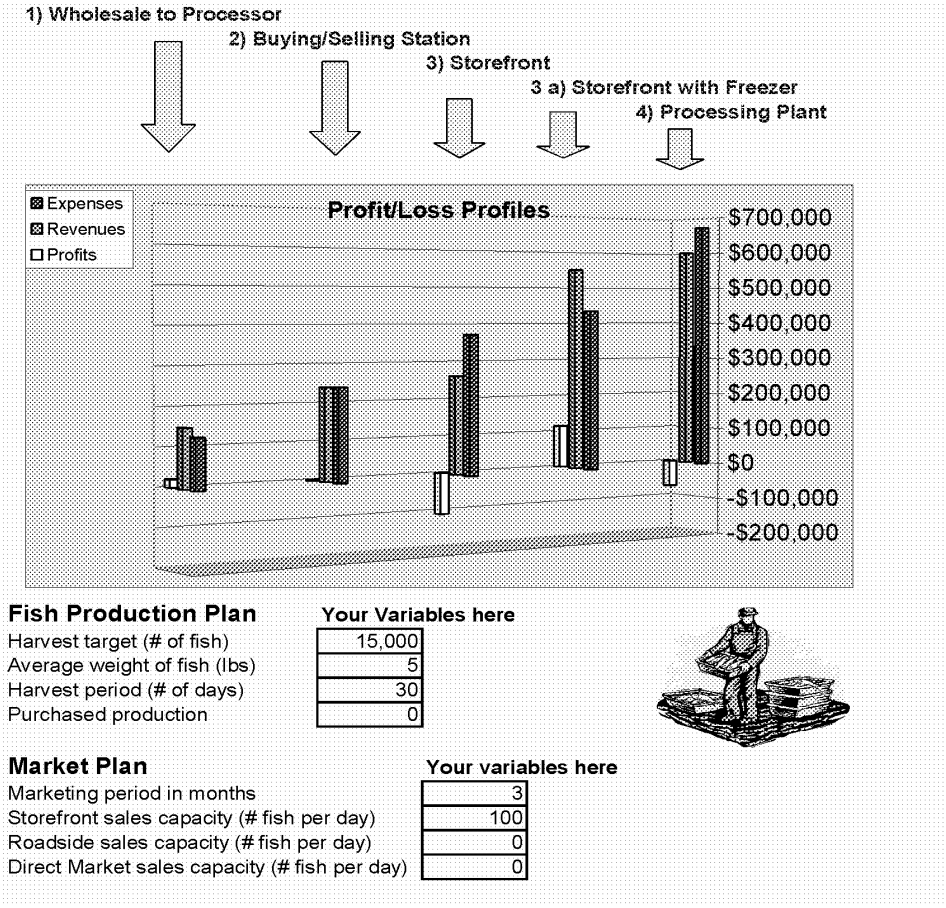


Figure 8. *Fish-In-Plan*™ - An interactive fisheries business planning tool

The basic business modeling undertaken illustrates the value of local sales and the utility of on-site freezing to extend the period of local sales. It also illustrates economy of scale and the value of cooperative-like partnerships in production to reduce down-time and to hold market interest.

The cost of setting up a storefront and micro-processing plant may outstrip profits initially. However if annual harvests and sales are relatively stable and meet break-even thresholds, a storefront operation would pay for itself in as little as 4 years, or even sooner with blast freezing capacity (Fig. 8).

There is also potential for mobile infrastructure that is able to move between fisheries to minimize capital investment in areas that experience highly variable production. However this has not been tested.

Conservation and other values

In the Fraser River, many First Nations have embraced the values that are espoused by the Marine Stewardship Council that emphasizes sustainability. They aspire to be selective and target harvestable surpluses. They have tended to be terminal or near-terminal in nature, and each has committed to the conservation and non-economic FSC priority, and there is a common desire to refine in-river stock assessment to effectively address priorities in the fishery so that allocations for economic purposes can be effectively managed around these other priorities.

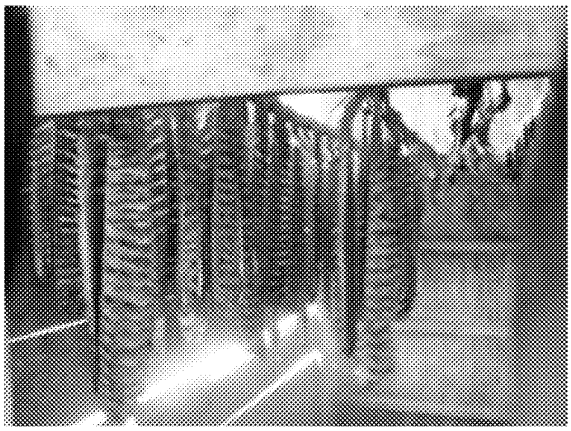


Figure 9. Salmon drying rack at *Esketemc* (Alkali Lake)

To plan and develop effective in-river harvests amongst the allocation priorities will require increased information and more detailed analysis than has been done to date. To begin to take apart the management of Fraser salmon to be able to predict and deliver volumes of fish for spawning and catch in terminal areas will require a better understanding of the interactions between abundance, timing and fishing pressure in the Marine areas, as well as the mixed stock areas of the Fraser River itself.[20]

Fraser sockeye, pink, Chinook and chum salmon have a variety existing management models. For sockeye and Chinook, daily or weekly time steps or boxes plot migration of fish that are moved through fishing areas in computer simulation models. These models can be used to predict and assess the effects of fishing on the mixes and individual stocks. Existing models for pink and chum salmon are not as detailed, nor is well developed. None of the existing models adequately address the delivery of fish for fishing in the terminal or near terminal areas adequately.

Figure 10. First Salmon Ceremony at Chehalis

The focus of former efforts has been, in the main, to manage the mixed stock fisheries in the marine areas and the lower Fraser. As part of planning the demonstration fisheries there is an explicit effort to build a model that will be useful to predict and assess terminal abundance and to try to shape the in river harvests to meet the needs of the terminal areas.

The outcomes sought as part of the program will be to better achieve conservation and/or escapement targets, and to meet the priority FSC targets (non-economic needs), as well as provide opportunities in the terminal areas for commercial fishing. In this way the developing Fraser salmon fishery will truly address the aspired goals for quality, value and sustainability.

[20] Mike Staley pers. com.

Alternative economic opportunities

Little has been said about alternative economic opportunities in this or other analysis of the Fraser salmon fishery. But that does not mean that the only way to generate an economy from Fraser salmon is through commercial sale.

There are economics associated with the guided sports fishery and the operation of associated service industry. The industry of sport fishing has grown in the Fraser River despite variable allocation. However, unless the local First Nation is a guide, operates a landing site or campground, has shares in tackle companies, or sells fishing boats, there is little opportunity to tie that revenue to their local community. To benefit from this fishery there needs to be stability that will only come from First Nations and local sports fishers agreeing on catch ceilings so that the fishery is selective and does not outstrip local catch potential. And, local collaborations must consider creative ways to add value to that fishery in ways that are economically meaningful to the local First Nation. Few Bands have experienced guides, landing and boat launch sites. Yet, the off-reserve landing, parking and camping sites are over-subscribed in the Fraser. Further, there remains much work to be done to protect and perhaps integrate local Aboriginal culture with the fishery.

Landing sites that are properly designed to accommodate movement of fishers and tools in the commercial fishery are also useful to sort and wash the local sport catch on site (if properly designed), and some even provide primary processing facilities for the public. Landing sites may also serve as parking, launching and monitoring sites for sport fisheries. Combining the utility in a good landing site in both fisheries may enhance the value for both sectors.

Acting well before it's time, one First Nation tried over a decade ago to combine eco-tourism with dip-netting and discovered that the "opportunity fee" was worth more than the fish. Clients from a local lodge, catering to eco-tourists, flocked to the opportunity to try their hand at dip-netting. The catch was cooked in traditional ways and served with stories that enhanced the understanding of the local fishery. Alas that project conflicted with the policy of the day, and the project was shut down until it could procure its salmon from a legally licensed salmon fishery in the ocean.

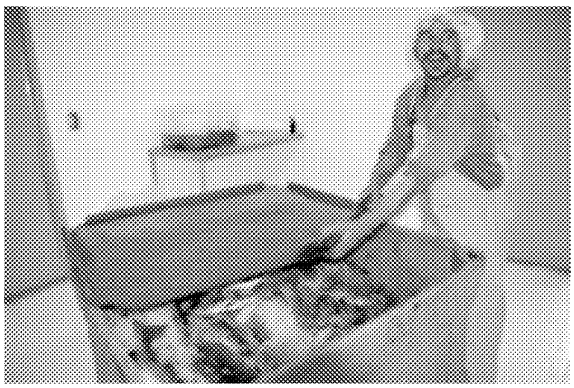


Figure 11. Processing pink salmon at Siska Band's micro-plant on the Fraser

We point this out not to be argumentative, but to open the door to thinking about the myriad ways that a community can exploit the fishery that benefit both the fish and the fishing community. To be truly successful, a salmon quality management program in the Fraser River should consider the full range of fisheries, perhaps think beyond marketing of fish meat, and may even consider a broad diversity of benefit strategies in the fishery. All-the-same, everyone can benefit from the image people bestow on what is arguably a world class resource.

Chapter 2 Introduction to a Vision

This project was inspired by the efforts of First Nations who are exploring the viability of in-river Fraser salmon fisheries. This Vision has not been formally endorsed by any First Nations. However, through this report we are able to acknowledge the important and fundamental lessons learned in their experimental fisheries – some dating back in current history to the 1980's and further. More importantly, we *introduce the building-blocks* from their experience, which in turn is represented in a program vision. It is hoped that the ideas gathered here will help to guide the sustainable development of future economic opportunities and truly inspire a Vision for the Fraser River salmon fishery.

The "*Program Vision*" will reflect upon practical ways and means to sustain the maximum social and economic benefits from the in-river fishery based on early experience by First Nations. Titled ***River-to-Plate*** the supporting ideas will emphasize the value and wholesome qualities of the Fraser River salmon, and sustainability of the fishery. These ideas are based upon a commitment to sound fisheries management, best-quality and value built into business plans, and the high degree of accountability demanded in today's market-place.

This project has also attempted to provide a Quality Management Program proposal that extends beyond food, designed to meet the challenges of this developing industry head-on, and introduces a detailed strategy of actions, with timelines, budgets, roles and responsibilities to get the program off the ground. Proposed in its inaugural year 2008, this work is to be considered a framework, adapted and reported on through experience over each of the next 4 years. It will form the basis of consensus building among First Nations and their fishermen, emerging commercial fishing enterprises, industry partners and regulators, far beyond the horizon of this program.

This project will:

1) Create a clear vision for development of the First Nations' commercial freshwater harvest, processing, and trade of Fraser salmon;

2) Continue to report on the implementation plan, adapted from experiences of First Nations, government, academia, and industry leading to the implementation of fisheries reform in the Fraser River.

Figure 12. First Nations Best Practices Forum in the Fraser River – sharing with DFO

The Fraser River Salmon

An Icon for a New Era of Sustainable Commercial Fisheries Management

Future inland commercial salmon fisheries of the Fraser River will depend less upon large volumes of fish to achieve viability, and more upon the unique and valuable attributes of Fraser salmon. After all, diverse Fraser salmon runs have sustained this fishery and the people of the river for thousands of years. Brought about by concern for protecting these values, and with the re-emergence economic opportunities in-river, First Nations leading these new initiatives have aspired to high quality standards, are promoting their own products and innovations, and are conveying a vision of more value, accountability, and sustainability from all Fraser salmon fisheries.

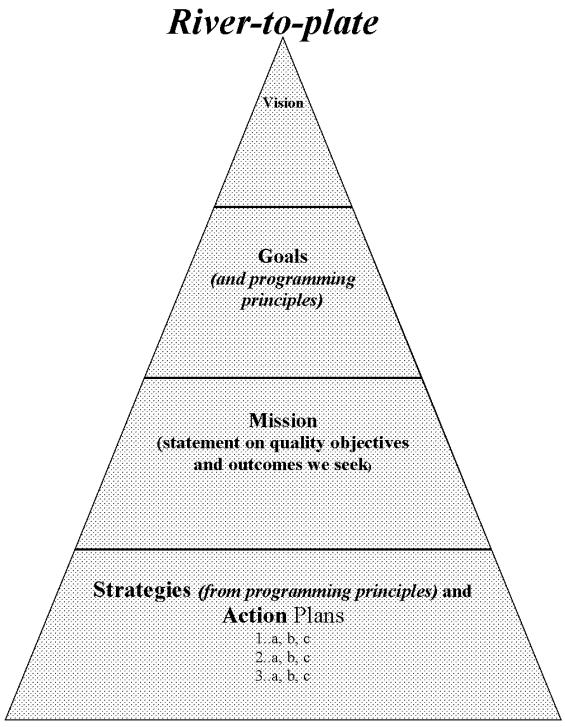


Figure 13. ***River to Plate*** **Vision Pyramid**

So at this time – this is more *their* program vision. The common energy sustaining this vision will come from traditional values and attention paid to the quality of the catch, and extending this philosophy along the value chain, engaging everyone from producer to consumer in their mission. The supporting program will draw from the success of a similar vision piloted in the marine fishery,[21] adopting "***River to Plate***" as the mantra for this Fraser salmon fishery of the future. The program is focused on, but not exclusively relevant to the new economic opportunities for First Nations in the Fraser River... Lessons learned and investments in quality and accountability will also be relevant to the rapidly evolving recreational fishery.

Through this collaborative approach, participants in the new river-fishery will work with fishers and fishing communities, industry and regulators to capitalize on the wholesome qualities and values of the river-caught salmon. Successful fishers will be promoting branding of their catch, emphasizing the unique qualities of their fishery, as well as distinct aboriginal salmon products and innovations they create, and above all, making Fraser salmon more accessible to our diet.

[21] *Ocean to Plate – DFO's vision of the Ocean to Plate approach is aimed at the seafood sector encouraging all stakeholders, including government agencies and those involved in all levels of the seafood value chain, are working towards a common goal of a sustainable, economically viable, and internationally competitive industry.*

A Program Vision

To promote Fraser River salmon, the fishing cultures, the river fishery and the natural wholesome food it produces, as certifiably sustainable.

Our Fraser River salmon originate from cold-water, selective, artisanal fisheries that are beneficial to the salmon, the participants, and the consumers.

Goals for River-to-Plate

The following goals have been generated from early in-river commercial experience by First Nations and their partners:

I. Sustainability
II. Quality
III. Value

These 3 goals provide a principled structure for cultivating sustainable salmon fisheries in the Fraser River, and provide a strategic foundation for the program vision for *River-to-Plate*. They also are an icon for the program vision representing the building blocks underlying the strategic work of First Nations demonstration fisheries in the Fraser River.

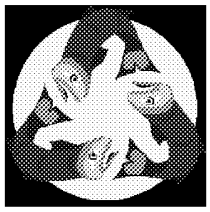
Excerpts from the program vision and the quality management mission are highlighted to illustrate the direction First Nations are taking under each goal.

A set of 9 programming principles follow each goal statement, divided into 3 compellingly similar groups. These are proposed both as the basis for formulating performance measures and a guide for related program development in the Fraser River.

Proposed strategies and actions were prepared for the inaugural program year 2008, and implemented in pilot projects as the foundation for refining strategic planning to 2012 (Chapter 4). They are not perfect, but they provide a guide to performance measure and adaptive planning – they will be reviewed annually.

An Icon – simple, clear and it's ours.

I. Sustainability ~ "*…emphasizes the distinctiveness of Fraser salmon…a more collaborative, open, and transparent market-place… a selective, sustainable fishery…that provide incentives to all participants for achieving value, quality, and traceability objectives"*



"*Our communities all have stories about conservation and sharing our salmon. We have prioritized the needs of the fish and our people before consideration of commercial fisheries. So as we develop experimental commercial fisheries on salmon, we are compelled to ensure that systems are in place to protect the salmon and our FSC needs, because it is who we are."*

Chief William Charlie
Chehalis Indian Band

1. Voluntarily adopts as a standard of excellence the principles, codes of conduct, and regulation for sustainable fishing, handling and processing, fair trade/export, and food safety.[1]

2. Advances the philosophies of precautionary fishing and management imperatives contained in the DFO Wild Salmon Policy, and embrace the priorities of access articulated in law (i.e. Sparrow SCC 1990, Gladstone).

3. Promotes transparency, traceability and orderly conduct in the trade environment that includes fishers and commercial fishing enterprises in the value chain as an incentive for quality, value and sustainability in the fishery.

Figure 14. Chehalis Hatchery rack fishery and Harrison River seine fishery

II. Quality ~ "*to seek ways to achieve the best value and use of the in-river salmon catch by building quality standards into harvesting, handling, and processing …to promote the Fraser River salmon and the salmon fishery and the natural wholesome food it produces…*"

"*We recognized early-on that the success of our future communal fishery would firstly depend upon good stock assessment, and secondly to generate good value from our catch from both sales and ongoing stock assessment.*"

Chief Fred Sampson
Siska Indian Band
Fraser Salmon Hero's Award, 2008

4. Set standards for quality management to promote quality, value, and marketability of all salmon and salmon parts

5. Create methods and systems along with the tools, information and training to maintain a value/quality-chain from fisher to consumer

6. Employ monitoring and traceability systems starting at the point of harvest and ending at the consumer to protect quality and value of salmon and salmon products

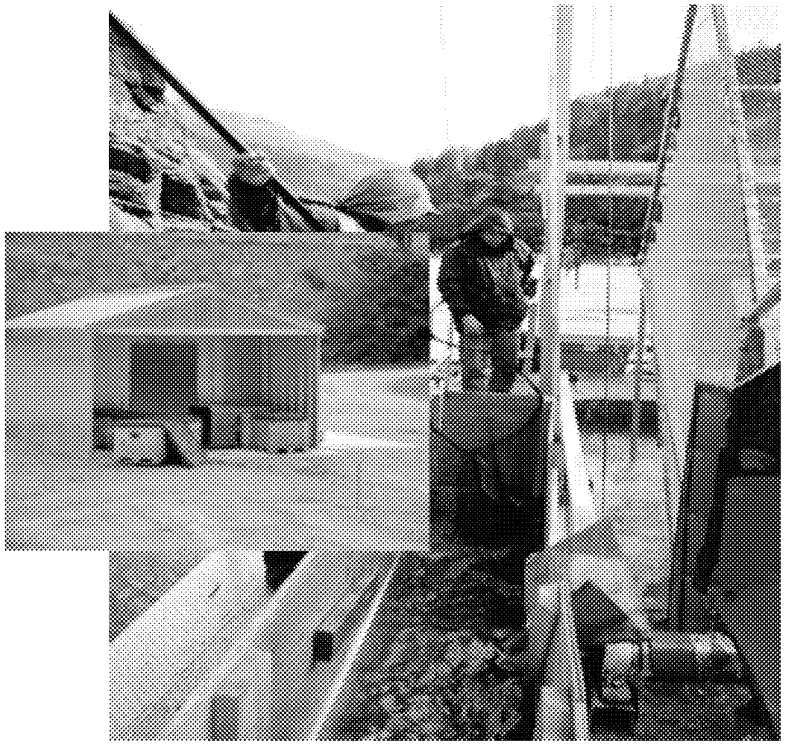
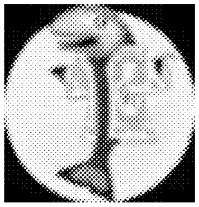
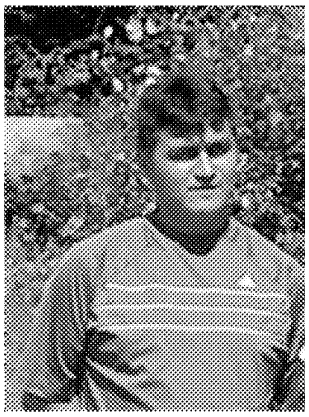


Figure 15. Fishwheel catch and micro-processing plant at Siska

III. Value ~ "*... certifiable, cold-water, sustainable fishery, beneficial to the salmon, the participants and the consumers*"





"*Our investment in a fish plant was ahead of its time. We look forward to a time when our communities are fully involved in the fishery... a time when we don't have to wholesale our salmon to survive, and we aspire to brand our catch with the value it deserves.*"

Chief Andy Phillips
Scowlitz Indian Band

7. Cultivate fisheries with viable business plans, that meet or exceeds Marine Stewardship Council standards, that optimize local values and benefits from the fishery, and that encourage local reinvestment in the fishery

8. Build relevant products and markets needed to utilize all fish and fish products, and minimizing waste and wholesale while optimizing value

9. Reward fishers, fishing-communities, and their commercial fishing enterprises for voluntarily meeting program standards by engaging community producers in the value-chain and creating a principled market-place to support community-friendly trade

Figure 16. Scowlitz fish plant and Harrison Bay landing site

Chapter 3 River-to-Plate: a Fraser River salmon QMP

A ***Quality Management Program (QMP)*** envisioned for the Fraser River salmon fishery will carry the mission forward into the fishery. A program for the Fraser is desired that brings together fishers, regulators and academia with business planning that values sustainable fishing, quality fish, and a supportive trade environment. The future businesses of Fraser salmon will combine the distinctive and wholesome attributes of Fraser Salmon with a more community-friendly market-place to achieve the goals in the fishery.

The Program described here, will aspire to full traceability on the catch from fishery to consumer, and will emphasize economic incentives along the *value chain* derived from attention to these objectives. The successful program will enable access to the tools and incentives for fishers, processors, and marketers working together in this value-chain. The enhanced economic performance of the fishery will value the fishery; building regulated inland markets for salmon, creating new salmon products, and tapping into new markets.

Our mission (key messages highlighted)

Our mission is to seek ways to achieve the best value and use of the in-river salmon catch by building ***quality standards into harvesting, handling, processing, and marketing*** *in ways that emphasize the distinctiveness of Fraser salmon runs; to create a more* ***open, and transparent market-place*** *for the trade of in-river Fraser salmon with local fishing communities; and, to* ***advance a collaborative program of work that supports principled fisheries providing incentives to all participants*** *for achieving sustainability, quality, and quality objectives along with full traceability from river to plate.*

Figure 17. Chinook salmon sampling at Siska fish plant September 2008

What is a Quality Management Program?

Attention to the quality of the fishery, salmon catch, and the trade environment underlies the strategy to value the Fraser salmon fishery in *River to Plate*. Quality management planning as proposed in this strategy will focus on the fishery, but draws from the experience elsewhere in the industry.

Quality Management Plans (or QMP's) are mandatory in all federally registered fish processing plants and are arguably necessary to manage food quality standards in licensed fish processing businesses. These programs incorporate an internationally recognized system for ensuring food safety through quality controls generally known as Hazard Analysis and Critical Control Points[22] (HACCP Plans). QMP's also include other quality and regulatory requirements such as product quality labeling, finished product weights, and date of harvest.

Managing quality in the Fraser Salmon fishery

The details of quality management plans and principles that were outlined in River to Plate 2007 have been summarized here for brevity to allow for a greater discussion on the pilot projects. The approach in 2008 focused on the application of quality plans in the fishery, and follow-up on quality at the fish plants and their certified QMP's.

The proposed Fraser River salmon QMP (***River-to-Plate***) will draw lessons from these plant-based plans and apply these quality control principles directly into the fishery and to the Fraser salmon value chain as a whole. This approach will emphasize the sustainability, value, and quality attributes of this fishery from the fishery to the consumer.

The program will emphasize voluntary controls community-based sustainable fishing practices and local investment in landing programs to protect fish quality, initiate traceability at the point of harvest, highlight Fraser branded lines of products, and create clear distribution points to build in traceability to the plants and market place. This approach will enable producers to market their greatest quality attributes – linking the market incentives back to any participating fisheries.

Field activities need to begin with organizing the complex logistics of each of the in-river fisheries – from catch to landing (sorting, bleeding, icing, transport times, etc.), aimed at protecting the natural qualities of the catch so that the catch retains its greatest market attributes.

This approach piloted in 2008 allows for a clear integration of each part of the value chain in the strategy that meets the objectives of sustainability, food safety/quality standards, and traceability, and benefits from it. It is also easy for a third-party auditor to verify that the *Fraser Salmon QMP* is working throughout the value chain. In time it is expected that the value derived from this fishery-wide QMP will be incentive enough to draw in more participants. A set of key objectives emerged from the project in the mid-Fraser where the catch of Chinook salmon represented an unknown range of qualities, values and presented unique logistical challenges.

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[22] *International HACCP Plan information can be found in the section Hazard Analysis and Critical Control Point System and Guidelines for its Application found in Codex Alimentarius - Food Hygiene - Basic Texts - Second Edition published by the Food & Agriculture Organization (FAO). Weblink: http://www.fao.org/DOCREP/005/Y1579E/y1579e03.htm#TopOfPage.*

Quality Management Objectives for New Projects (drawn from strategic objectives and pilot activities in 2008):

1. Establish a quality sampling standard to communicate and compare fish qualities between various inland salmon stocks and fisheries;

2. Create fishery-based QMP's with locally unique objectives that are able to define the best quality attributes and to achieve the quality standards set for each fishery and stock (i.e. cooling rates, holding times, handling instructions - like bleeding, transport requirements, etc.);

3. Plan local logistics and infrastructure to support the QMP objectives for each fishery that take into account challenges to quality control like landing times, warm water/air temperatures, distance to processing, ice availability, transport times etc.;

4. Work with the producer and processor to create a system of communications, traceability, monitoring, and verification systems to enable market guarantees of quality, and best economic return to the producer;

5. Facilitate business planning between producers, processors and marketers that takes into account QMP standards, logistics, labeling and marketing that best suits each fishery.

Labeling

Labeling is a requirement on retail food products and there is a growing expectation that in the future all food products sold under license in BC must be labeled and traced back to its source. In the case of the Fraser salmon fishery, fish may need to be traced back to a license of capture. However on the fresh product label itself, consumers will be looking for date of harvest, best before date, and instructions on handling.

Perhaps producers may even want to include point of harvest on labels to further inform consumers about the qualities inherent in their product. Of course any processed fish with added ingredients will also be required to list those ingredients on the label as well.

Figure 18. Chinook meat quality color coding at Siska fish plant 2008

Business development and quality of the Fraser Salmon fishery

The business of inland Fraser commercial fisheries has been driven by availability of catch and accessibility to the fishery, but the real value comes from the best use of the fish and a commitment to quality and value, and a sound traceability plan. In the context of planning commercial fisheries however, access to the salmon fishing economy still has more to do with available licenses. Assuming that allocation inland is not limiting the growth of highly efficient fisheries (i.e. the future), value and profit is more about what fishers do with their catch.

The successful inland commercial fishery business must choose a business model best suited to the local fishery, infrastructure, and training in advance of the fishery. Most importantly, business plans (scope, production objectives and organization), and must be tailored to maximize the quality and value of the catch referenced earlier. This is particularly important if the fishery business is based in indeterminate volumes or small bite fisheries.

Certification of Fraser salmon fisheries may be one way to capitalize on the value of in-river fisheries. The process of certification is however, both rigorous and complex, and although the benefits of certification are compelling, the costs of being certified are, in the case of Fraser in-river fisheries, still undefined. In fact, each of the many possible in-river selective and terminal fisheries is unique, and developing an efficient and cost effective process for alternative certification of these fisheries is a priority (i.e. self certification through branding).

Finally, the new economic opportunities espoused in DFO's *Pacific Fisheries Reform* call for the proponent to pay for their own monitoring through cost-recovery, and in some cases local projects are also generating funding to pay for enhancement and stock assessment projects. In summary, business plans inland should address the following (at a minimum):

- A business model for the local fishery (products, markets, defined quality parameters)
- Costs and logistics plan to implement QMP in local fishery
- Allocations by species, production objectives, organization, governance
- Cost recovery and re-investment plans (from management plans, harvest, and landing logistics to traceability/catch monitoring, stock assessment and even enhancement)

Figure 19. Graded chum eggs from the Harrison River on their way to caviar production

Incentives and First Nations demonstration fisheries

The right to an economy from the Fraser River salmon fishery is acknowledged in the IIFC Treaty[33], but most of the Fraser First Nations aren't able to harvest enough fish for food[34]. PICFI is none-the less grappling with valuation, exploring share-based fisheries and other such matters that must precede any formal large-scale transfer of licenses in-river.

The new salmon producer must work in greater collaboration just to maximize quality and value, and sell as much possible locally. A long history of so-called black market fisheries are a reasonably indication that inland markets do exist, but not all of the inland salmon catch is as easy to sell fresh as sockeye. Product development has thus emerged more from the necessity to find inexpensive ways to utilize all of the catch, and/or to find cost-effective ways to move unsold catch into appropriate markets. It is relatively easy to sell fresh ocean-bright sockeye and well matured Chum caviar. It is more difficult to sell pale salmon meat and fish with colored skin without knowing the intrinsic qualities of the catch. Often the value can only be determined by processing the catch.

The inland salmon producers in these early experiments are learning to achieve the best market access and resulting return on investment from producing a consistent standard of food quality control. The successful salmon producer therefore will maximize their sales potential and value by ensuring that there are no regulatory encumbrances to markets beyond local fresh sales, and traceability systems are in place so that the fish business receives the reward from this effort. So the new producer is encouraged to consider regulation not as an encumbrance, but an enabling aspect of business development underlying long term profitability.

Notably, unlike the coastal fishing companies who depend on large volumes and sufficient variety of catch to supply several months of business, the operation of fish plants inland do not have access to fish year-round to pay for a large capital investment or staff for planning. Therefore, inland producers must ensure the market viability of the fishery by creating more value from less fish.

This represents a mammoth effort for the small producer that inevitably begins with training fishers and managing remote site logistics to support quality objectives in the fishery – long before an allocation is confirmed. Often that means a business investment in superior handling even in remote situations, in sorting, washing and labeling – an effort far greater than would be found in a wholesale fishery. This brings the producer into direct collaboration with the regulators and standards that govern quality management and traceability.

Figure 20. Courtesy of Kamloops Daily News

[33] *Fraser River Inter-tribal Treaty "Of mutual purpose and support", August 1998.*
[34] *DFO records on meeting communal license targets for First Nations fisheries on Fraser salmon 2000-2006*

Tools for the Fraser Salmon Trade

The trade in Fraser salmon is seasonal, and until share-based fisheries are implemented effectively, commercial salmon production will be fast-paced and leave little time for sound business planning. This trade environment is responsible for the pitfalls that drive the current wholesale and low-value market for Fraser salmon harvested in-river.

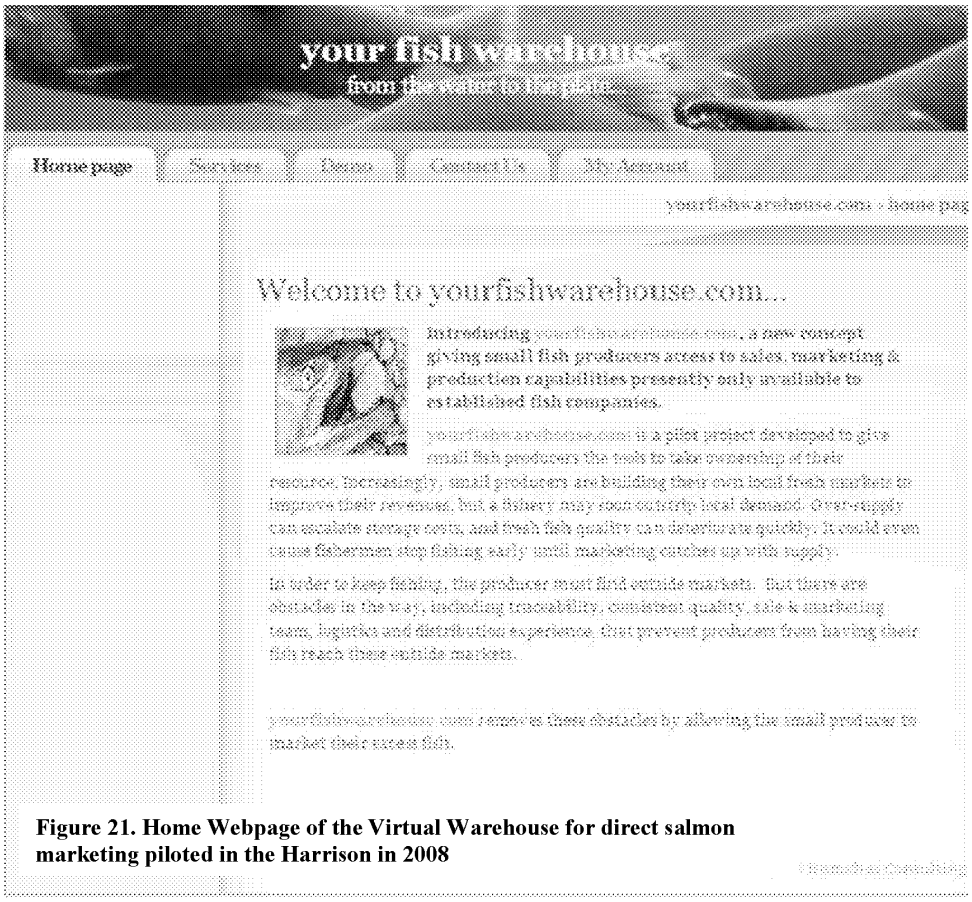


Figure 21. Home Webpage of the Virtual Warehouse for direct salmon marketing piloted in the Harrison in 2008

The formal commitment to trade standards therefore begins with the producer. The Fraser Salmon QMP begins where salmon are harvested. Where producers (fishers or fishing enterprises) voluntarily agree on a suitable Fraser Salmon QMP, their salmon production not sold locally may be sold collaboratively through a "virtual warehouse", a web-based environment for the regulated trade of salmon harvest. Conditions for access to the QMP are to include both participating producers and buyers/processors. The system was piloted in 2008.[35]

[35] *The virtual warehouse was hosted by the Chehalis and Scowlitz joint-venture in the Harrison River Demonstration fishery in 2008. The Architecture and management of the site was provided by consultant Shaw Hamid, with operational support from 7-Seas. The project was funded by a contribution from DFO's PICFI*

Participation in collaborative branding (contracts on quality):

1. Commitment QMP standards, principles, and use of brand
2. Adoption of control measures, and tracking systems (provided by program)
3. Pre-fishery plan on sales and traceability (warehouse and/or local sales)
4. Participation in training
   (familiarity with standards/systems)
5. Satisfactory past performance

There can be no production sold wholesale through the Fraser salmon "virtual warehouse". At a minimum, all salmon will be sorted, graded, pre-washed and iced, at a cost borne by the price of the sold product. Lots of dressed, filleted, and otherwise processed salmon will be offered at a price commensurate with the added value, along with the guarantee of the program and 100% traceability, from the point of harvest and into the market. In the initial pilot proposed for 2008, the prototype will involve a small number of producers and processing companies interested in marketing the enhanced production. Producers can market their own production through the site, or than can pay a fee out of the final sales for brokerage.

Processing companies will have the option to prequalify[36] and, as producers "volunteer", they will be able to "surf" through profiles of these in-river salmon fisheries, familiarizing themselves with species, production goals and schedules, and buy salmon in this supervised trade environment. Fees for the virtual ware-house are initially born by the program during the proposed 4-year development phase, but eventually it is expected that they will be borne by the market.

Access to the "Virtual Warehouse" for collaborative quality and inventory system are being provided to by buyers and producers who initially wish to pilots a Fraser Salmon QMP for their fishery. The pilot will involve a level of interaction beyond the trade environment with producers, buyers and regulators in order to effectively integrate quality standards and traceability systems over time.

Conditions for collaborative production in the Fraser:

1. Participation in preseason planning and training sessions
2. Acceptance of control points
3. Commitment to quality management systems linking producers with fish plants and integrated traceability systems
4. Signed agreements with codes of conduct tied to continued access to the warehouse

[36] *Demonstrated licenses and permits in place, agree to conditions of traceability, and commitment to a code of conduct*

Inland Salmon-Seafood-hub of BC Food Research Centre

First Nations have always known that river-caught salmon are wholesome food. Compared with marine caught salmon however, salmon harvested in-river have often been miss-labeled as poor quality – perhaps a designation that some 10,000 freshwater salmon anglers would also disagree, as would a budding caviar industry that depends upon eggs harvested on the final approach to the spawning grounds. Despite this, there is less known about the qualities of the inland salmon harvest that harvested in the marine fisheries. In-river producers need to work with industry develop common measures for egg and meat qualities. They also want to work with processors to develop best practices in handling, traceability, and lines for strategic product development that best reflect the values of their catch.

Therefore, there is a demand for collaborative research to aid in the understanding of the market potential of the inland Fraser salmon fishery. In a recent collaborative study into the need for a center of excellence for B.C. Food & Bio-Products Technology Centre, UBC included the idea for a best practices hub for the budding inland salmon fishery to work together in foods science and with industry: "*There are many attractions of the Centre for the First Nations community. The Centre could help First Nations move ahead with some of their product development plans for food processing and overall economic development. This assistance could range from finding new markets for value-added products, providing training programs, improving food processing job skills to improving sales, marketing and business planning effectiveness.*"

The future economics of the Fraser salmon fishery will hinge upon ways of managing fish quality and optimizing the values in the fishery. In the absence of this business investment, the artisanal fishers of the Fraser can expect conflict rather than harmony with the marine salmon fishery, and will languish against the forces of wholesale and waste. Variable quality and sometimes small catches are challenged with affordable investment in processing capacity, and inland research collaboration may just be the way to sort it out.

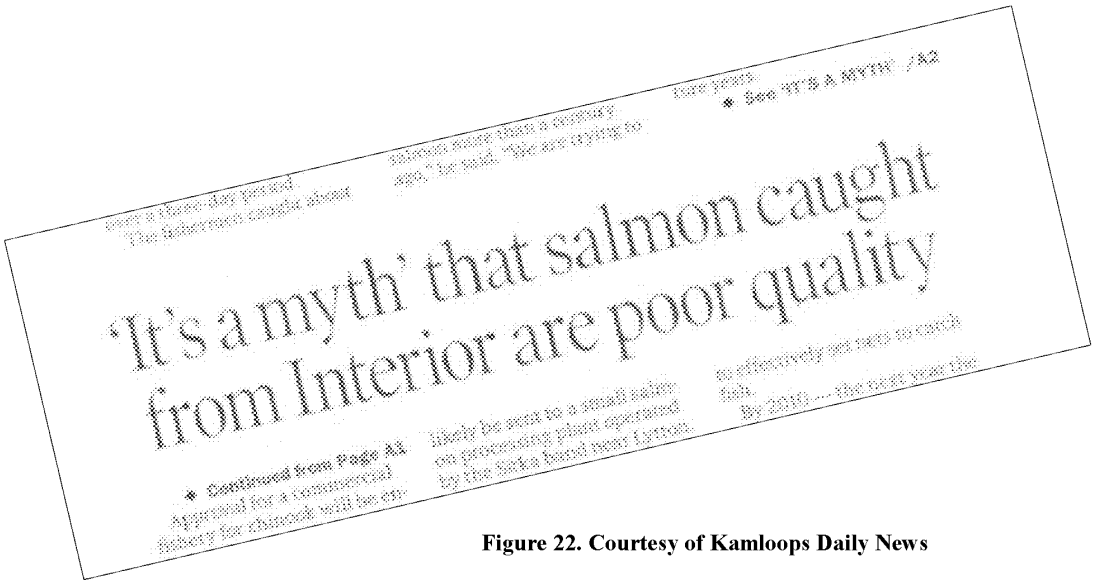

'It's a myth' that salmon caught from Interior are poor quality

Figure 22. Courtesy of Kamloops Daily News

Chapter 4 Strategies for a Sustainable Fraser River Salmon Fishery

The following report on pilot projects has been designed to illustrate ways in which First Nations are working to implement the ***River-to-Plate*** Vision through collaborative programming. Pilot projects are designed and managed by these First Nations, working along with government, academia, and industry and simply involve those who see the sea-change, and are looking for appropriate ways to participate.

Each action or set of actions reflects a strategy in ***River to Plate*** and pilot projects led by First Nations reflect its programming principles. Their work is designed to meet locally relevant challenges, and serve to advance one or more of the watershed program Goals, and to move their Mission forward.

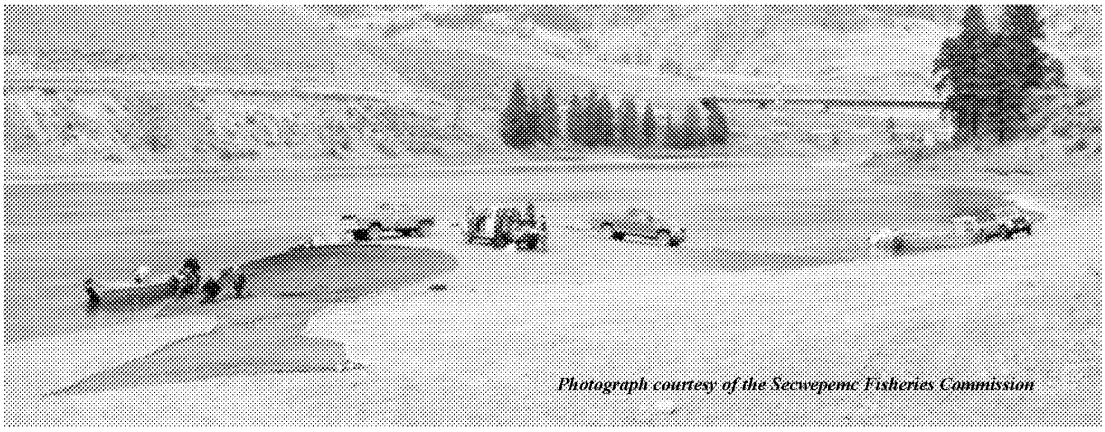
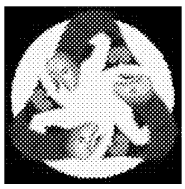


Figure 23. *Secwepemc* seine fishery at Savona

I. Sustainability



1) Standards of Excellence

Goal: To develop and maintain a program advisory committee and open network made up of representatives of Fraser First Nations, regulators (ex-officio[40]), and academia to oversee programming. The quality management program is the centerpiece of the program.

Results: The Fraser Basin Council's *Salmon and Watershed's Program* has contributed to the communications and reporting of the River to Plate programming in the Fraser Watershed hosted by the Fraser River Salmon Table. The support made it possible for several localized workshops, watershed networking, and a referral process that supported collaborative proposal writing (PICFI, IFMP, BC Capacity Initiative etc.). The support of UBC and BCIT Food sciences and the pilot projects has provided a part time foods sciences coordinator. This coordinator worked to develop quality management plans at Siska, traceability analysis and pilot project in the Harrison, and piloted standards for quality assessment of Thompson River Chinook and Okanagan sockeye in year 1.

Table 2. River to Plate – Progress Report Summary

Strategy		Results
1. **Standards of Excellence**	✓	Networking and coordination funded by Fraser Salmon and Watershed's Program
2. **Sustainable fisheries objectives**	X	Not funded; preliminary investigations by Fraser Salmon Table
3. **Promote orderly trade and accountability**	✓	Pilot work by *Secwepeme* Fisheries, Siska, Chehalis and Scowlitz First Nations
4. **Standards through cooperative networking**	✓	Virtual warehouse piloted on the Harrison River by Chehalis/Scowltiz
5. **Create quality management tools/systems**	✓	Cooling field trials, pilot QMP, and sampling program with Kamloops Lake Chinook
6. **Employ business planning mentors**	X	Not funded; mentoring planning with PICFI but implementation was delayed
7. **Cultivate fisheries, business plans, benefits**	✓	A joint feasibility study was funded by PICFI involving the *Secwepeme* and Siska
8. **Build relevant products and markets**	X	No product development research was funded
9. **Rewards in the value chain**	✓	No certification funded but incentives derived from cooperative work with virtual warehouse

[40] *Regulators and other government officials benefit from being present in some decision-making meetings – although they are not empowered to say what a program must do, only what it cannot do. The intent is not to dictate, but to help organizations understand guidelines etc. (from Canada-BC Framework Agreement on Agrifoods Risk Management)*

2) Advance sustainable fisheries objectives

Goal: To develop computer–based modeling as the basis for planning in-river fisheries, to organize economic opportunities and plans to meet conservation and FSC priorities, and support share-based fishery planning.

Results: The Fraser Salmon Table engaged biologists to assist with a planning pilot to initiate management modeling around commercial fisheries objectives that explicitly manages for in-river conservation and FSC priorities[42] , while providing links to marine fisheries targeting the same fish – a computer-based adult salmon harvest shaping model is sought to be applied in a single or multiple fisheries. The project includes a review and assessment of existing analyses, models and ongoing work to determine the degree to which these other efforts can be used or modified for use in this context. The first phase has been limited by funding and a clear transfer of allocation into the Fraser River to work with. The second phase will be to develop any original models or adapt existing models for use in this project.

The initial focus of this effort are proposed to begin with the lower Fraser chum and in particular fisheries in the Harrison and adjacent river mouth (where a likelihood of selectively fishable TAC exists) and shaping of harvests to optimize access to the stocks of salmon that are available in that area. Lessons learned from this work will be useful in further developing a tool for other watersheds or areas of the Fraser system.

Both of these phases will be done in a collaborative environment with the agencies and organizations that are doing this other modeling work such as the Pacific salmon commission, DFO, universities such as SFU and UBC, and external consultants such as LGL. The project will require intensive review and analysis of existing data, as well as computer programming to develop the models.

Some of this work is best done in workshop settings to bring together the individuals who have easy access to the data and who have good understanding of the biology, geography, and methodologies needed. There will also be other interactive settings once prototype tools are ready. DFO and First Nations need to assess the efficacy of the tools and refine them as needed.

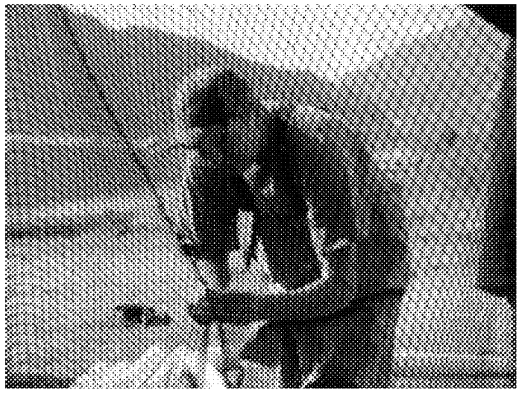


Figure 24. Net mending on the Harrison

[42] *Mike Staley, 2008. Prototypes for in-river harvest shaping.*

3) Promote transparency, traceability, and orderly conduct in the trade environment

Goal: Improved monitoring and traceability systems is desirable (catch and sales); linking producers, processors, and consumers in the value chain. The output here is accountability from source to market.

Results: A quality program pilot was initiated with the *Secwepemc* Fisheries Commission working with Siska Fish Plant, and at Chehalis funded by DFO (PICFI) and the Fraser Salmon and Watershed's Program.

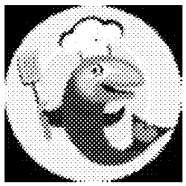
A QMP was prepared with the *Secwepemc* Fisheries Commission outlining specific quality control objectives for Kamloops Lake Chinook. This was supported by a detailed sampling program, field cooling trials, and plant-based valuations. The QMP was able to highlight control points and measures, and gaps in the handling program arising in transportation, holding, and staging at the fish plant. Plans for 2009 include more efficient processing at Siska fish plant, shorting holding times at the plant, and better transport protocols for fish sent to coastal fish plants (temperature and weight/quality accounting). At the plant, a system of production accounting also needs improvement. An improved system of marketing and sales of the fresh catch is also being planned.

At Chehalis a literature review (examining the role of high tech stuff) and chain of custody report was prepared to identify control points in the Harrison chum fishery for both quality controls and product traceability, including a gap analysis. The traceability system demonstrated a community-based model to manage a community-friendly trade environment, provide financial incentives to fishers for sound quality management and traceability. The close-to-real-time reporting inherent in traceability systems empowers the fishers to evolve to greater heights in the value chain, improving employment and income prospects in the fishery. Plans for 2009 include greater attention to weights at the landing site and more efficient lot tracing.

Associated reports:

1) *Secwpemc* Fisheries and Siska program feasibility Study and QMP, SFC 2009
2) Harrison River Test Fishery 2008 – Investigations and results. Wilson K. H., and K. Charlie
3) Traceability Literature Review - Traceability Tools for an Inland Fishery. Robertson, R., UBC
4) Traceability Plan for 2009. Robertson, R. UBC
5) Chain of Custody Documentation (Gap Analysis) in a Harrison Chum Case Study. Robertson, R., UBC

Figure 25. Kamloops Lake Chinook are chilled in an ice slurry before transport in shave ice in 2007



II. Quality

4) *Set standards ~ Fraser salmon virtual warehouse and cooperative network*

Goal: Setting standards and a traceability protocol among a defined group of Fraser salmon fishers and processors piloted in 2008 enabled the market to target this production, and for the participating fishers to brand their catch. Participation was voluntary, but being involved engaged the community producer (the financer) and the fishers with qualified and bonded buyers. Incentives are derived from a focus on tracking individual lots, their quality and their value. This in turn enables implicit branding of group production. It also provides industry access to qualified fish production. Pre-qualification or program certification will be provided for harvesters, processors and marketers to protect the quality of the fish their investment and the trade environment.

Results: A "Virtual warehouse" for organized traceability and self marketing was piloted in 2008 in the Harrison River to manage fish originating from a network of salmon producers involved in a demonstration chum fishery. A consultant was hired to create the operating architecture for the web-based warehouse for controlled, and the Chehalis and Scowltiz First Nations organized their fishermen in a cooperative-like assembly to pilot operations. Chum salmon were sold directly by the participants as a collective on the web-site, generating on average of approximately 35% more than the best wholesale price on the river for the fresh catch (after expenses). The sponsoring communities were also able to generate cost recovery for monitoring and landing services. Access to the web-site was provided to agency observers and two interagency workshops were convened to provide feed-back on the development of the site.

The sales and processing options involved a network of processors in Vancouver and Bellingham. The program provided web-based access for the producers to production inventory reports and management options, marketing, logistics and credit support, industry news and market alerts ~ the prototype generated voluntary quality standards, marketing protocols for transparency and conduct, along with 100% traceability.

The inventory was managed by the "virtual warehouse" though a number of plants and freeze storage plants on behalf of the network. The "Associate's" fish were made available for sale to pre-qualified customers logging in to the warehouse. Lots of salmon were custom produced for sale by the warehouse, they were posted for buyers, and they were brokered by the warehouse for a fee. Economic efficiencies with the system will increase with the size of lots, and/or a decrease in the number of lots.

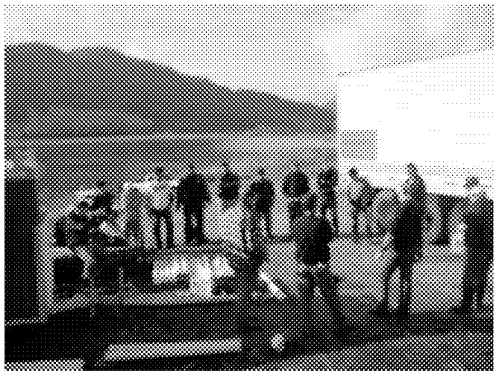


Figure 26. Harrison Fishermen receive training on the use of recovery pens for by-catch before fishery in 2006

5) Create quality management methods and systems: tools, information, training

Goal: Quality management methods, tools and educational materials are to be generated that will contribute strategic investment in control points (e.g. icing systems, sealable totes, landing site and micro-processing development) to enhance the quality and traceability of river salmon fisheries, leading to greater monitoring, better value to sustain smaller fisheries, and less infrastructure.

Results: This objective was advanced in a limited way in 2008 through the continued field testing of temperature loggers and the development of a QMP associated with the *Secwepemc* Fisheries Commission's the summer Chinook fishery on Kamloops Lake. Ongoing challenges with information sharing in the fishery arise from the poorly compatible software associated with the loggers (i.e. data are not easily downloaded to a standard program like Excel), and much remains to be learned about handling eggs for caviar at the plant. Plans for 2009 will either seek alternative temperature logger systems or find ways to better adapt the technology for real-time reporting.

There was limited investment in the development of training materials, plans or other systems due to the lack of funding. Proposals were developed to the BC Capacity Initiative and the Sto:lo Nation Human Resources Department for systems and training pilots in the lower Fraser in 2009.

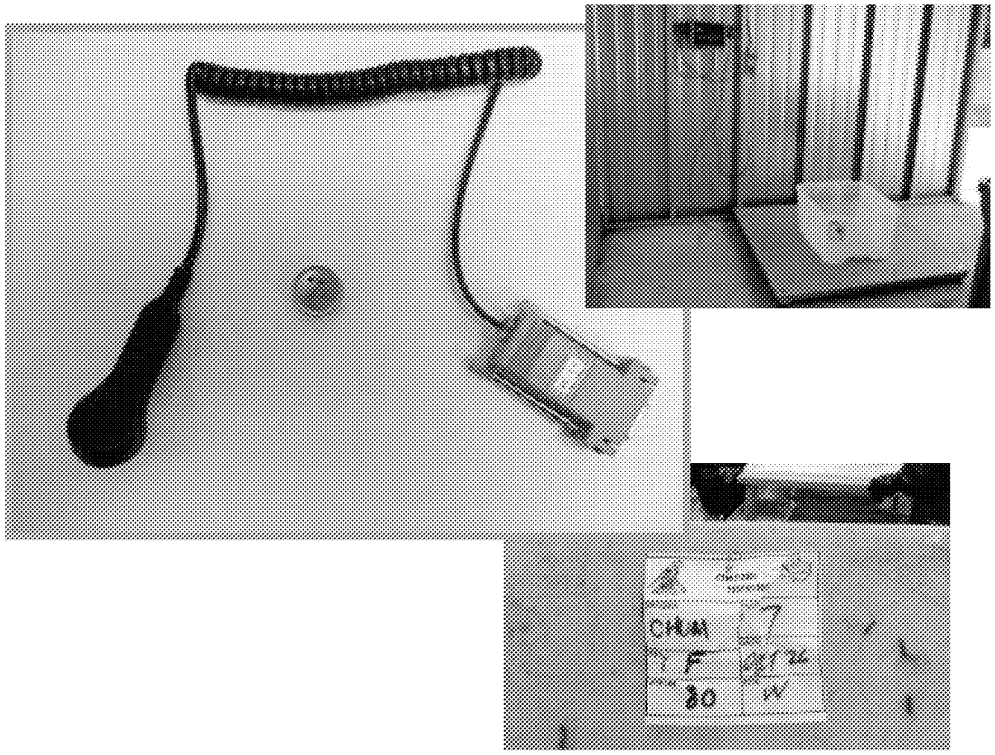


Figure 27. Temperature logger used in field cooling trials, a digital tote scale, and a simple but important tote tag

6) Employ quality, monitoring and traceability systems in business plans

Goal: Demonstration projects represent points of commercial salmon transfer provided by DFO's pool of licenses held in trust from DFO's Allocation Transfer Program since 1994, and they present an opportunity to plan new systems of monitoring, quality control, and traceability into business plans. A system of Quality management coordinators or program planning mentors for new demonstration fisheries has been proposed.

Results: Some experimentation continued with quality, monitoring, and traceability systems in the Kamloops Lake fishery, in association with joint studies at the Siska Fish plant, and in the Harrison River involving Chehalis and Scowlitz First Nations. Some systematics work was undertaken in association with these fisheries in 2008. The projects were able to plan fisheries using volunteer work of consultants and/or support funding from small projects. Some of this work in the Harrison River was funded by the *Salmon and Watersheds Program* as part of a traceability study. A significant focus has been planned in 2009 on expansion of the web-based warehouse, training of fishermen, procedures at the landing site, and generating accurate weight accounting at the point of landing.

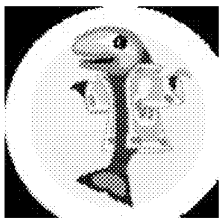
Demonstrating viability and sustainability in the inland salmon fishery is a key objective of Pacific Fisheries Reform. Therefore an investment is proposed (perhaps cost-sharing) in coordinators for planning these new fisheries and mentoring for QMP's and associated production/business planning. Work on processing systems, product sales and marketing of the inland salmon catch is proposed to guide investment in appropriate technologies, quality control systems, and traceability systems during the period of fishery development.

Currently, this work is allocation dependent and undertaken in the last couple of weeks before a fishery since there is currently no mechanism to manage for in-river TAC. The work plans, fishing proposals and business scrutiny applied to these plans are unlike fishery planning in the marine commercial salmon fisheries.

No funding was provided for the development of coordinators or mentors in 2008 and projects face continued challenges in developing viable plans required by DFO for consideration in allocating licenses for inland fisheries.

Figure 28. A Chehalis fisherman voluntary logs catch, effort and biological data

III. Value



7) Cultivate fisheries with viable business plans and that optimize local values and benefits

Goal: To support ongoing feasibility planning support for First Nations in the Fraser to formulate effective strategies and business models for their own fishery. Working closely with local quality management coordinators or mentors, these projects need to focus on key outcomes:

- Best suited business model for local fishery
- Business plan to implement QMP in local fishery
- Scope, local production logistics, organization, processing and marketing/sales agreements
- Cost recovery and re-investment plans (traceability/catch monitoring to stock assessment, habitat restoration and salmon enhancement)

Results: A joint feasibility study was funded by DFO's PICFI to assist the *Secwepemc* Fisheries Commission and Siska Fish Plant to determine minimum catchy requirements, to sort out logistical and quality management challenges, and to test local markets. A small amount of on-site mentoring funding was provided for UBC support and consulting professional support. The largest portion of the grant was dedicated to operations of the landing, transport and processing program. The Commission committed some of its own AAROM resources to the fishery and made some progress in fishing efficiencies. More work is needed to increase the efficiency of the fishery and the processing plant, and the partners faced challenges in both marketing and sales due to delays in processing and maturity of the fish. However, local markets for the fresh fish were strong. There were small incremental steps made in building the business enterprise, however since no funding was available beyond the immediate feasibility study, there was only limited progress towards mentoring, building business plans, or enterprise partnerships.

8) Build relevant products and markets

Goal: To lead a salmon food sciences round-table of producers, processors, food nutrition experts etc. Focus on analysis linking fishery and market strategies, including product development (food systems, labeling, aboriginal branding, and best-use/value) and research (flavorings, natural color enhancers etc). Partnerships need to be forged between commercial salmon enterprises and processors to collaborate on building local fresh and value-added markets to optimize value, and provide support when the inland catch out-strips local capacity. The objective will be to make best use of salmon, while avoiding over-capitalization and transport costs.

Results: There was no progress on the in-river food-sciences round-table of producers or research on product and markets largely due to the lack of funding.

9) ***Rewards in the value chain***

Goal: Incentives and rewards – Fishery certification is considered a long term effort that rewards the participants by opening up markets (i.e. MSC certification). The starting point is working with each community involved in conducting in-river economic opportunity fisheries to ensure that the community understands the potential costs and benefits of certification. More immediate incentives can come from assisting fishermen and fishing communities to find financial incentives for meeting the *River to Plate* program goals – an approach likened to self certification.

Results: No progress was made on exploring certification. However it was identified that the standards set by demonstration projects in the Fraser currently exceed MSC certification and that a process of self certification should be considered as a function of collaborative branding in the future. The self marketing and traceability experiment conducted in the Harrison River in 2008 by Chehalis and Scowlitz provide immediate financial incentives to that fishery (see Goal 3, Strategy 4).

Figure 25. Sunrise on the Harrison River landing site – ready and waiting

Chapter 5 A draft 2 - First Nations Fisheries Strategy and Action Plan for Fraser Economic Salmon Fisheries

2008-2012 Taking the Vision on the road

Working together to share these early experiences, the participating First Nations from the lower, middle and upper Fraser have maintained a best-practices forum since 2005 to share experiences among like-projects, with regulators, industry and academia. They have engaged with the Fraser River Salmon Table, enjoyed the forums provided by the Fraser River Aboriginal Fisheries Secretariat, and collaborated with like-projects on the Skeena.

Continuing in 2009 and each year there-after to 2012, they will take the project on the road to test the assumptions through collaborative programming, to refine the strategies in practice, and to probe the program vision for clarity and accuracy. It is expected that in the annual revisions to the program document, based on lessons learned and feed-back, these leading projects will help to adapt these ideas to the true First Nations vision for these fisheries.

Under Review

The 2009 *Draft 2* – Vision, program and strategies contemplated here-in are designed to help First Nations, regulators and industry to implement *reformed* economic opportunities in the Fraser River salmon fishery. *River-to-Plate* is based on the goals ~ *Sustainability, Quality, and Value* that are informed by early experience driving this change – from the Fraser and elsewhere.

River-to-plate ~ Implementation 2008 -2012

Strategies 1-3 are being ushered in through existing First Nations fisheries staff dedicated to the priority of conservation, better escapement management, and managing for the priority of FSC fisheries. It is expected that the economic elements will foment in the current policy environment to advance sustainable fisheries priorities. The success of a future commercial salmon fishery in the Fraser River will come from a foundation of good science, stock assessment, and selective fishing. ***River-to-Plate*** adds economic expression to this programming.

Strategies 4-6 form the foundation of supporting business plans to manage for quality, value and traceability objectives in the fishery. However, the skill sets needed for these strategies are distinct from those currently vested in the First Nations fisheries organizations in the Fraser watershed. In the absence of an investment in these alternative local skill sets, the Fraser salmon fishery is destined to languish in wholesale and waste indefinitely. In 2008, a small investment has gone a long way towards greater understanding and collaboration.

Strategies 7-9 emphasize the values in the fishery, and cultivating the businesses and products that best reflect the world class qualities inherent in the Fraser River fishery.

The strategies emphasize work both at the watershed and the project level to be successful. Collaboration in natural capacity aggregations is encouraged (lower, middle and upper Fraser). This foundation of collaboration will put the local fishing enterprises into production partnerships as flexible and dynamic as the fishery they depend upon. It will empower the local fisheries organizations to build businesses and invest in infrastructure that are appropriate to the distinct circumstances and values inherent in their fisheries. This core capacity over the next 4 years will be the target for training, mentoring, and sharing of best practices, and will be the future source of viable business planning in the watershed.

A simple organizational chart below portrays a practical division of investment. The distribution of energy of these QMP coordinators is implicitly shaped by the active interest in the programming in each area.

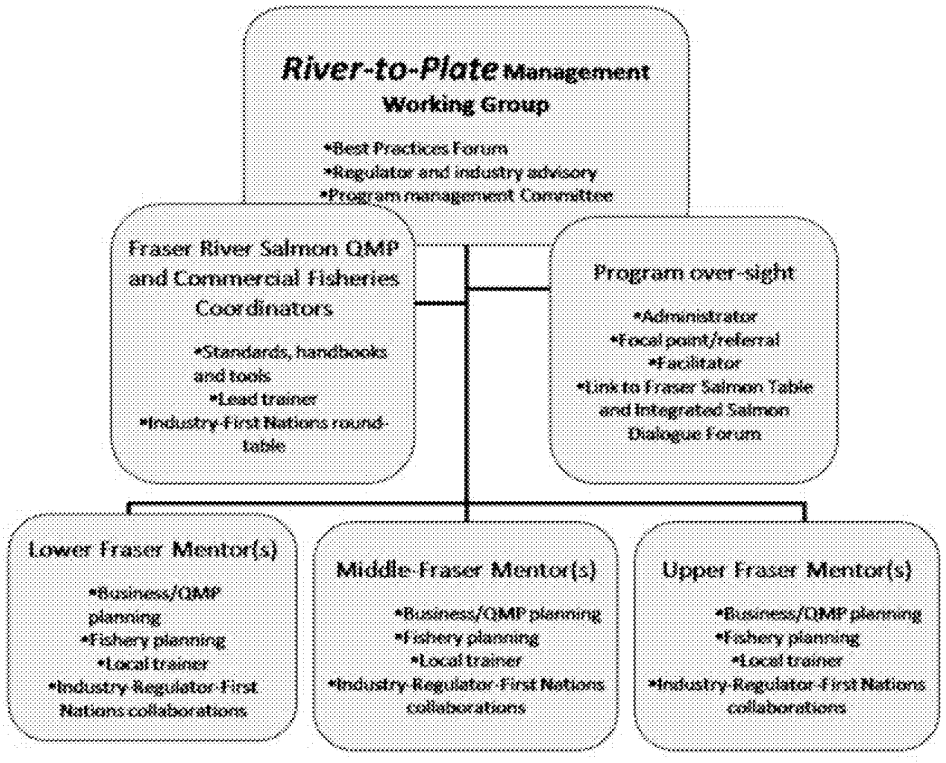


Figure 24. Inland Fishery QMP Mentoring Organization Chart

Building Solid Economic Opportunities

The BC First Nations Action Plan is subtitled "*Preparing for transformative change*". The *Action Plan* acknowledges that the Pacific fisheries, including salmon, are facing a time of radical transformation, in response to both local and global influences. Ideas like those in ***River-to-plate*** are characterized in the *Action Plan* as "Building Solid Economic Opportunities". In their synopsis: "*First Nations need to design economic opportunities in fisheries in a manner that avoids pitfalls such as over capacity, overcapitalization and the resulting poor economic performance. What tools do First Nations need to create fisheries that provide long lasting benefits that support economic independence and contribute to healthy First Nations?*"[44]

Business and quality management program are considered synonymous in the Fraser River salmon fishery. The inland fisheries in particular cannot build their businesses on volumes and high efficiency harvesting, so they must make the most of quality and value for the fish and the fishing communities they depend upon.

Next Steps ~ 2009/10

1. Rolling dialogue along with DFO, First Nations, and collaborating agencies on the Fraser River about program development (along with PICFI roll-out);

2. Protecting non-economic fisheries values – building a collaborative watershed pilot with links to marine fisheries;

3. Allocation and salmon harvest requirements to meet needs of action plan and beyond – working with Fraser demonstration projects, pilot sales, Treaty measures etc. along with PICFI, Fraser Salmon Table, and Integrated Salmon Dialogue Forum;

4. Training - Maximizing social and economic benefits from economic fisheries – engaging demonstration projects and best practices forum, QMP business, mentoring, and training plans;

5. Market demand for Fraser salmon – round-table with proponents, industry and regulators, product research and development, and the long approach to certification.

[44] *Jones, R. 2006. First Nations Action Plan for Fisheries in BC.*

Appendix I. Glossary

Food Safety	Protecting the food supply from microbial, chemical and physical hazards or contamination that may occur during all stages of food production and handling.
Control Measure	Any action and activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level.
Critical Limit	A limit that separates acceptable from unacceptable.
ISO 22000	A business management system that addresses safety requirements of the food safety supply chain.
Monitoring	A planned sequence of observations or measurements to ensure compliance to critical measures.
Quality Management Plan (QMP)	Quality Management Plans incorporate an internationally recognized system for ensuring food safety through quality controls generally known as Hazard Analysis and Critical Control Points (HACCP Plans). QMP's also include other quality and regulatory requirements such as product quality labeling, finished product weights, and date of harvest.
Verifying	The application of activities including procedures, tests and audits to determine compliance to the QMP.

Marine Stewardship Council

According to their web-site, the Marine Stewardship Council (MSC) is "*an independent, global, non-profit organization whose role is to recognize, via a certification programme, well-managed and sustainable fisheries and to harness consumer preference for seafood products bearing the MSC label of approval, or eco-label. At the centre of the MSC is a set of Principles and Criteria for Sustainable Fishing which is used as a standard in a third party, independent and voluntary certification programme. The MSC standard consists of three principles. Each principle is elaborated by a number of criteria. The three principles consider the:*

1. Status of the target fish stock.
2. Impact of the fishery on the ecosystem.
3. Performance and effectiveness of the fishery management system".[45]

[45] *Marine Stewardship Council, 2005*

Appendix II. MSC Principles and Criteria for Sustainable Fishing

At the centre of the MSC is a set of *Principles and Criteria for Sustainable Fishing* which are used as a standard in a third party, independent and voluntary certification programme. These were developed by means of an extensive, international consultative process through which the views of stakeholders in fisheries were gathered.

These Principles reflect a recognition that a sustainable fishery should be based upon:

- The maintenance and re-establishment of healthy populations of targeted species;
- The maintenance of the integrity of ecosystems;
- The development and maintenance of effective fisheries management systems, taking into account all relevant biological, technological, economic, social, environmental and commercial aspects; and
- Compliance with relevant local and national local laws and standards and international understandings and agreements

The Principles and Criteria are further designed to recognise and emphasise that management efforts are most likely to be successful in accomplishing the goals of conservation and sustainable use of marine resources when there is full co-operation among the full range of fisheries stakeholders, including those who are dependent on fishing for their food and livelihood.

On a voluntary basis, fisheries which conform to these Principles and Criteria will be eligible for certification by independent MSC-accredited certifiers. Fish processors, traders and retailers will be encouraged to make public commitments to purchase fish products only from certified sources. This will allow consumers to select fish products with the confidence that they come from sustainable, well managed sources. It will also benefit the fishers and the fishing industry that depend on the abundance of fish stocks, by providing market incentives to work towards sustainable practices. Fish processors, traders and retailers who buy from certified sustainable sources will in turn benefit from the assurance of continuity of future supply and hence sustainability of their own businesses.

The MSC promotes equal access to its certification programme irrespective of the scale of the fishing operation. The implications of the size, scale, type, location and intensity of the fishery, the uniqueness of the resources and the effects on other ecosystems will be considered in every certification.

The MSC further recognises the need to observe and respect the long-term interests of people dependent on fishing for food and livelihood to the extent that it is consistent with ecological sustainability, and also the importance of fisheries management and operations being conducted in a manner consistent with established local, national, and international rules and standards as well as in compliance with the MSC Principles and Criteria.

MSC Executive
November 2002

Preamble

The following Principles & Criteria are intended to guide the efforts of the Marine Stewardship Council towards the development of sustainable fisheries on a global basis. They were developed assuming that a sustainable fishery is defined, for the purposes of MSC certification, as one that is conducted in such a way that:

- it can be continued indefinitely at a reasonable level;
- it maintains and seeks to maximize, ecological health and abundance,
- it maintains the diversity, structure and function of the ecosystem on which it depends as well as the quality of its habitat, minimizing the adverse effects that it causes;
- it is managed and operated in a responsible manner, in conformity with local, national and international laws and regulations;
- it maintains present and future economic and social options and benefits;
- it is conducted in a socially and economically fair and responsible manner.

The Principles represent the overarching philosophical basis for this initiative in stewardship of marine resources: the use of market forces to promote behaviour which helps achieve the goal of sustainable fisheries. They form the basis for detailed Criteria which will be used to evaluate each fishery seeking certification under the MSC programme. Although the primary focus is the ecological integrity of world fisheries, the principles also embrace the human and social elements of fisheries. Their successful implementation depends upon a system which is open, fair, based upon the best information available and which incorporates all relevant legal obligations. The certification programme in which these principles will be applied is intended to give any fishery the opportunity to demonstrate its commitment to sustainable fishing and ultimately benefit from this commitment in the market place.

Scope

The scope of the MSC Principles and Criteria relates to marine fisheries activities up to but not beyond the point at which the fish are landed. However, MSC-accredited certifiers may be informed of serious concerns associated with post-landing practices. 46

The MSC Principles and Criteria apply at this stage only to wildcapture fisheries (including, but not limited to shellfish, crustaceans and cephalopods). Aquaculture and the harvest of other species are not currently included.

Issues involving allocation of quotas and access to marine resources are considered to be beyond the scope of these Principles and Criteria.

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[46] *Other complementary certification programmes (e.g., ISO 14000) provide opportunities for documenting and evaluating impacts of post landing activities related to fisheries products certified to MSC standards. Constructive solutions to address these concerns through appropriate measures should be sought through dialogue with certification organisations and other relevant bodies.*
MSC Executive
November 2002

PRINCIPLE 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery [47]:

Intent:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria:

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

PRINCIPLE 2:

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Intent:

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria:

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.

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[47] *The sequence in which the Principles and Criteria appear does not represent a ranking of their significance, but is rather intended to provide a logical guide to certifiers when assessing a fishery. The criteria by which the MSC Principles will be implemented will be reviewed and revised as appropriate in light of relevant new information, technologies and additional consultations*

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2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.

3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

PRINCIPLE 3:

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process;

3. be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings;

4. observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability;

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5. incorporates an appropriate mechanism for the resolution of disputes arising within the system[48];

6. provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;

7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;

8. incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion;

9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;

10. specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:

a) setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
b) identifying appropriate fishing methods that minimize adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
c) providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;

d) mechanisms in place to limit or close fisheries when designated catch limits are reached;
e) establishing no-take zones where appropriate;

11. contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

B. Operational Criteria

Fishing operation shall:

12. make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;

[48] *Outstanding disputes of substantial magnitude involving a significant number of interests will normally disqualify a fishery from certification.*

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13. implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;

14. not use destructive fishing practices such as fishing with poisons or explosives;

15. minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.;

16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and

17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

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Appendix III. Draft Canada-British Columbia Agricultural Risk Management Companion Program Principles

July 18, 2001

These principles pertain specifically to Canada / BC agreements, but are consistent with those with other provinces, not to be regarded as flexible.

Funding should be provided for a limited period to help the industry stakeholders adapt to structural changes, to capture new opportunities, and generally to contribute to producers achieving sustainable, stable and adequate farm income.

- *Funding under this agreement cannot replace an ongoing program.*
- *Government should initiate, facilitate, and get out.*
- *This cannot replace a government income support program.*
- *The program should avoid applying funds to low-priority opportunities*
- *or going against the intent.*

Respect the need for equity among regions and agri-food industry stakeholders.

- The program should not disadvantage others; it should first do no harm.

Q: What about the Vancouver Island (regional) initiative?
A: This initiative does not do any harm elsewhere. It is not for substitution of mainland imports. Also, it does not preclude any other regional initiatives.

Consistent with Canada's international and domestic trade commitments, and therefore minimizes the risk of countervail.

- *see trade issues from Framework Agreement.*

Funds will not be used for export subsidies.

Funds should contribute to initiatives which will be economically viable and self-sufficient.

- *This principle should be interpreted broadly; the sector should be viable not necessarily the individual project being considered.*

Programs may complement but should avoid duplicating, overlapping or replacing federal and provincial programs.

- *This does not preclude "leveraging" or "stacking" funds with other programs, however. This would depend on the guidelines of the other programs involved. For example, there may be a limit on total government contributions to a specific project.*
- *Projects must avoid "double-dipping", e.g. obtaining matching contributions from more than one fund with the same industry contribution*

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- *All applications must fully disclose all funding sources proposed, and withstand a post audit.*

Initiatives should minimize moral hazard.

- *Projects must avoid opportunities for contortion or subversion of intent, e.g. manure storage facility used for RV parking.*
- *Projects must avoid benefit to individuals, e.g. demonstration projects which upgrade equipment for all cooperators on the pretense of demonstration – technology transfer.*

Funds should be used for programs which benefit the industry as a whole or are generally available to an identified group who meet eligibility criteria.

- *Projects should have broad industry or society benefits; they are not intended for normal commercial expansion.*
- *The program design will have the flexibility to fund up to 100% of projects that have a broad public benefit.*
- *However, the closer the program is to 100% funding, the less likely the concept of a trust fund will be supported by Office of Comptroller General, and could have significant budget consequences.*

Benefits to the industry and public should exceed the costs.

The expectation is not to run a benefit/cost analysis on every project.
Costs to the public are defined and measured using common sense.

Projects should have clear public benefit that distinguishes them from a direct income supplement to individuals or firms.

- *Other safety net programs, e.g. WFIP, are intended to provide direct income supplements to offset demonstrated losses. The AFF Fund must not provide similar assistance.*

Funding should not be considered ongoing and will be approved for a finite duration. In some instances, worthwhile new projects may extend the results of previously completed projects.

Priority should be given to projects where there is industry direct or inkind financial support.

- *see cost sharing.*

Core funding is not provided.

- *There is a moral hazard of organizations financing their day-today activities. They need to distinguish core funding from incremental overhead. For example, salary for an existing staff person with reprioritized duties to work on the Fund is not an incremental cost, and is therefore not eligible. However, salary for an additional two days per week of program-related administration duties for an existing staff person is an eligible cost.*
- *In-kind contributions must be real incremental contributions, not just counting activities that were being done anyway. They must be able to sustain audit.*

Q: Does the existing trust fund guideline of 50% in-kind contribution pertain to AFFF?

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A: Not necessarily. It depends on the strategic plan and comes back to the Coordinating Team. For example, allowable in-kind contributions could initially be more than 50% of the industry contribution; they could be phased in to a 50% or lower maximum over a specified number of years.

Within the mandate of Agriculture and Agri-Food Canada.

- *Generally fisheries and forestry programs are excluded, but agroforestry projects probably acceptable. Depending on the strategic plan some parts of a strategic plan may not be eligible.*

In accordance with applicable federal and provincial acts, regulations, and environmental directives.

- *Program initiatives must obey the law as well as the intent of the program.*

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Appendix IV. Regulatory Entities with the Fishery

Control Points	Regulatory Framework
Fishery	**Marine Stewardship Council** The MSC promotes equal access to its certification programme for all fisheries regardless of their size, scale, ecology, geography or technology. The MSC has also developed guidelines for the assessment of small scale and data deficient fisheries. http://www.msc.org/assets/docs/DWP_web_2007.pdf
River **Fisheries Management-** • Conservation • Sustainability • First Nations inclusion	**Fisheries & Oceans Canada** Fisheries management through fishing plans and selective fishing plans. Development of policy from Pacific Fisheries Reform. The new policy is the Pacific Integrated Commercial Fisheries Initiative (PICFI). PICFI was developed from the results of the Pacific Fisheries Action Plan. The action plan included the approval of the Wild Salmon Policy, First Nation demonstration fisheries; legislative changes through the Fisheries Act Renewal Initiative: and industry and First Nations consultations. *Policy and Licensing* Allocation Commercial harvest licenses Communal licenses Landing sites
River to Landing Protection of fish and wildlife species and their habitat	**BC Ministry of Environment** **Fish & Wildlife Branch** Best Management Practices for roads and similar items that can impact the foreshore. **Environmental Stewardship Division (ESD)** The mission statement of the ESD includes: "maintain and restore the natural diversity of provincial ecosystems and fish and wildlife species and their habitat"
Landing	**Fisheries & Oceans Canada** The Fisheries Act must be followed when building or modifying a landing site.

Control Points	Regulatory Framework
Landing and Trade	**BC Ministry of Agriculture and Lands (BCMAL)** BCMAL licenses the fish processing plants, fish brokers and fish vendors through the BC Fish Inspection Act and Regulations, including annual fish production schedules. These regulations are enforced by the Fisheries and Aquaculture Licensing and Compliance Branch. *Licenses* Fish Vending Fish Brokers Fish Buyers http://www.agf.gov.bc.ca/fisheries/commercial/cabinet/FactSheet42.pdf
Employees	• Workers' Compensation Board • Revenue Canada – Unemployment Insurance
Processing licenses	**Provincial Health Authorities (In-Province Sales)** Health Authorities license provincial fish processing plants through the BC Fish Inspection Act and Regulations. The local Environmental Health Officer inspects and licenses the plant. *Licenses* Fish Processing
Guidelines	**BC Centre for Disease Control** Develops and provides educational material for the Environmental Health Officers (amongst others). Fish Processing Plants Food Safety Guidelines http://www.agf.gov.bc.ca/fisheries/licences/main.htm
Waste Management	**BC Ministry of Environment** The Ministry of Environment in responsible for the BC Environmental Management Act and Waste Discharge Regulations to ensure the protection of human health and the quality of water, land and air. Waste from the "fish products industry" must meet the requirements of these regulations.

Control Points	Regulatory Framework
Packaging, labeling, and export	**Canadian Food Inspection Agency** Responsible for administering and enforcing the Fish Inspection Act and Regulations. Also sets requirements for product labeling as outlined in the "2003 Guide to Food Labeling and Advertising". Licenses fish processing plants that sell products outside provincial borders including both inter-provincial and export sales. The Fish Inspection Act and Regulations states requirements for and allows an inspector to inspect any boats, vehicles or other equipment connected with fishing. The province and federal government may collaborate together on inspections at this level. http://www.inspection.gc.ca/english/anima/fispoi/fispoie.shtml *Licenses* Establishment and export Licenses
Distribution	**Provincial Health Authorities (In-Province Sales)** The Fish Inspection Act and Regulations states requirements for carriers and allows an inspector to inspect any vehicles that may contain fish. The Provincial health authorities through their Environmental Health Officers may conduct these inspections under the Provincial Food Health Act. Compliance officers from BCMAL may also be involved in these inspections depending on circumstances.
Retail Store	**Provincial Health Authorities** The BC Food Safety Act and Regulations states requirements for retail sale of fish (food). The premises are inspected by the Environmental Health Officers. Business licenses are issued by municipalities.
	Health Canada *Licensing and Policy* On-reserve sales Waste management Food safety Foodservice and retail outlet inspections.
Plate	**Customer** Customer buys a wholesome, high quality fish that is traceable to a fishery.

Appendix V. International Code of Practice General Principles of Food Hygiene (FAO Recommended)

1. Primary Production Objectives:

- Primary production should be managed in a way that ensures that food is safe and suitable for its intended use. Where necessary, this will include:
- Avoiding the use of areas where the environment poses a threat to the safety of food;
- controlling contaminants, pests and diseases of animals and plants in such a way as not to pose a threat to food safety;
- Adopting practices and measures to ensure food is produced under appropriately hygienic conditions.

Rationale:
To reduce the likelihood of introducing a hazard which may adversely affect the safety of food, or its suitability for consumption, at later stages of the food chain.

2. Design and Facilities Objectives:

Depending on the nature of the operations, and the risks associated with them, premises, equipment and facilities should be located, designed and constructed to ensure that:

- contamination is minimized;
- design and layout permit appropriate maintenance, cleaning and disinfections and minimize air-borne contamination;
- surfaces and materials, in particular those in contact with food, are non-toxic in intended use and, where necessary, suitably durable, and easy to maintain and clean;
- where appropriate, suitable facilities are available for temperature, humidity and other controls; and
- there is effective protection against pest access and harbourage.

Rationale:
Attention to good hygienic design and construction, appropriate location, and the provision of adequate facilities, is necessary to enable hazards to be effectively controlled

3. Control of Operation Objective:

To produce food which is safe and suitable for human consumption by:

- formulating design requirements with respect to raw materials, composition, processing, distribution, and consumer use to be met in the manufacture and handling of specific food items; and
- designing, implementing, monitoring and reviewing effective control systems.

Rationale:

To reduce the risk of unsafe food by taking preventive measures to assure the safety and suitability of food at an appropriate stage in the operation by controlling food hazards.

4. Maintenance and Sanitation Objective:

To establish effective systems to:
- ensure adequate and appropriate maintenance and cleaning;
- control pests;
- manage waste; and
- monitor effectiveness of maintenance and sanitation procedures.

Rationale:
To facilitate the continuing effective control of food hazards, pests, and other agents likely to contaminate food

5. Personal Hygiene Objectives:

To ensure that those who come directly or indirectly into contact with food are not likely to contaminate food by:
- maintaining an appropriate degree of personal cleanliness;
- behaving and operating in an appropriate manner.

Rationale:
People who do not maintain an appropriate degree of personal cleanliness, who have certain illnesses or conditions or who behave inappropriately, can contaminate food and transmit illness to consumers.

6. Transportation Objectives:

Measures should be taken where necessary to:
- protect food from potential sources of contamination;
- protect food from damage likely to render the food unsuitable for consumption; and
- provide an environment which effectively controls the growth of pathogenic or spoilage micro-organisms and the production of toxins in food.

Rationale:
Food may become contaminated, or may not reach its destination in a suitable condition for consumption, unless effective control measures are taken during transport, even where adequate hygiene control measures have been taken earlier in the food chain.

7. Product Information and Consumer Awareness

Products should bear appropriate information to ensure that:

- adequate and accessible information is available to the next person in the food chain to enable them to handle, store, process, prepare and display the product safely and correctly;
- the lot or batch can be easily identified and recalled if necessary.
- Consumers should have enough knowledge of food hygiene to enable them to:

- understand the importance of product information;
- make informed choices appropriate to the individual; and
- prevent contamination and growth or survival of foodborne pathogens by storing, - - preparing and using it correctly.
- Information for industry or trade users should be clearly distinguishable from consumer information, particularly on food labels.

Rationale:
Insufficient product information, and/or inadequate knowledge of general food hygiene, can lead to products being mishandled at later stages in the food chain. Such mishandling can result in illness, or products becoming unsuitable for consumption, even where adequate hygiene control measures have been taken earlier in the food chain.

8. Training Objective:

Those engaged in food operations who come directly or indirectly into contact with food should be trained, and/or instructed in food hygiene to a level appropriate to the operations they are to perform.

Rationale:

Training is fundamentally important to any food hygiene system. Inadequate hygiene training, and/or instruction and supervision of all people involved in food related activities pose a potential threat to the safety of food and its suitability for consumption.

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