Spawning Aquaculture 2.0

Summary report on the March 2, 2018 aquaculture stakeholder conference

Final Draft

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Support from: Canada Manitoba

Executive Summary

This report chronicles the proceedings and participant input from the Spawning Aquaculture 2.0 event that took place in Winnipeg, Manitoba on March 2, 2018. Key industry participants delivered a series of presentations that provided information and perspectives about the aquaculture industry in Manitoba. The presentations enabled participants to learn about industry trends, government programs and services and important industry considerations such as aquaculture species, recirculating aquaculture system (RAS) design and aquaculture product marketing. Facilitated group activities allowed participants to identify and assess a variety of important issues facing sustainable development of the industry. Participants investigated value chain components and structure, industry partnerships, challenges and barriers and next steps for the industry during the group activities. The aquaculture industry in Manitoba is small and probably not in line with the opportunity that exists. Given its current scope, some wondered if aquaculture in Manitoba is developed enough to be considered as an industry at this point. Regardless of semantics, as a relatively immature economic activity in Manitoba there appear to be great deals of both opportunity as well as challenge that will need to be carefully considered by people in diverse roles through the value chain for aquaculture to develop sustainably. By design, this report does not provide much in terms of analysis of Spawning Aquaculture 2.0. The report rather, was put together to be used as reference for future planning and developmental activities related to aquaculture in Manitoba.

Introduction and Background

This document is a report on the results of the Spawning Aquaculture 2.0 event that brought together a key set of stakeholders for the aquaculture industry in Manitoba. With support from the Department of Fisheries and Oceans Canada and the Government of Manitoba, Manitoba Agriculture organized the one-day event to create an opportunity to learn about the aquaculture industry in Manitoba, network with key industry participants and to solicit input and document the important issues facing the industry. The event was loosely modelled on the Spawning Aquaculture event that took place in 2005 in Manitoba (link to Facilitator's report). The timing of the event coincided with a time when reported aquaculture production in Manitoba is at its highest level in history. Although it is generally accepted that the level of production is not commensurate with the opportunity that exists, many factors point to the industry in Manitoba being on a stronger foundation than at any other time and so the timing for the event seemed right.

The format of the day included a series of presentations by key participants in the industry in the morning followed by moderated group activities in the afternoon. A qualified facilitator led the event proceedings to ensure that the day progressed in an orderly fashion and that attendees were encouraged to participate actively. The event also encouraged informal networking to enable connections to be made between attendees. The event agenda and list of attendees are included towards the end of this report.

Key stakeholders were invited to attend Spawning Aquaculture 2.0 with a "Save the Date" being sent late in 2017 followed by a formal invitation in January 2018 that included agenda and registration information. The invitations included the following messages:

It is with great excitement and enthusiasm that I send you this SAVE THE DATE notice for ***Spawning Aquaculture 2.0: a stakeholder conference****. I encourage you to mark your calendars for* ***Friday March 2, 2018*** *and/or pass along this notice to colleagues in your organization that you feel would be suited to consider attending. The full-day event will take place at the* ***Alt Hotel in downtown Winnipeg, Manitoba at 310 Donald Street****.*

Participants can expect to learn more about the foundation of the aquaculture industry already in place in Manitoba and participate in facilitated discussions about how to move the industry forward. The event will be loosely modelled on the original Spawning Aquaculture event that took place in 2005 and will take into consideration developmental activities that have ensued.

Summary report for Spawning Aquaculture, 2005:
https://digitalcollection.gov.mb.ca/awweb/pdfopener?smd=1&did=16258&md=1

The morning sessions will be a great way to learn more about the aquaculture industry in Manitoba before engaging in moderated group activities in the afternoon. During lunch, the opportunity to try Manitoba produced fish prepared by the chefs at The Merchant Kitchen will in itself be worth the price of registration.

The demand for fish protein products that Manitoba is well suited to produce through sustainable aquaculture is high. The industry has continued to advance in areas such as technology, feeds and marketing. Add in a stable increase in market prices for these products and aquaculture offers promising economic growth opportunities worth discussing.

A willingness to engage and embrace change is paramount and you as key stakeholders are people that can make a difference for the future prosperity of all industry participants through the aquaculture value chain in Manitoba.

Objectives

The purpose of the event was…

1. To learn more about the aquaculture industry in Manitoba.
2. To identify and assess opportunities and challenges facing sustainable development of the industry.
3. To strengthen the foundation for future growth of the industry, including enabling greater industry participation.

Presenters

Key industry participants delivered presentations to help attendees understand the current state of the industry. The presentations included information about the status of the industry in Manitoba, industry trends, technical considerations and available resources. The presentations allowed attendees to gain a better understanding of industry issues from different perspectives including producers, processors, marketers, service providers and government representatives. The presentations also served to stimulate

thoughts in advance of the facilitated group activities that took place in the afternoon (Copies of presentations used by presenters are included towards the end of this report).

The event facilitator, Tanis Ostermann opened the session by welcoming attendees and providing a high-level overview of the day's proceedings. Tanis presented the objectives of the day before turning the floor over to the first presenter…

Jeff Eastman, Industry Development Specialist – Aquaculture, Manitoba Agriculture delivered the first presentation titled *Sustainable Aquaculture Development: The Manitoba context*. The presentation began by defining aquaculture and highlighting global trends. Performance of the North American and Canadian aquaculture industry was presented, revealing that the industry lags other parts of the world. Reasons and opportunity for growth were also discussed and attendees were encouraged to reflect on how aquaculture might be an opportunity for their businesses, their organizations and how mutually beneficial partnerships could be established to seize opportunities. The presentation then shifted focus to the Manitoba situation and covered more specific opportunities for aquaculture in Manitoba. Considerations such as current industry capacity, regulatory requirements, resources available and market trends were summarized. The presentation concluded by characterizing the opportunity for sustainable aquaculture development in Manitoba and suggested what factors should be considered in order for potential to be realized.

The second presenter was…

Mandy Light, Regional Senior Aquaculture Management Officer, Fisheries and Oceans Canada. This presentation titled *Links to Prairie Aquaculture & Fisheries & Oceans Canada* included information about the Federal Government's Sustainable Aquaculture Program, the Aquaculture Activities Regulations, the potential for an Aquaculture Act and the Fisheries and Aquaculture Clean Technology Adoption Program.

Following a networking and health break, the third presentation of the day was delivered by…

Dave Stevens, Silk Stevens Limited from New Brunswick. Silk Stevens has been engaged in the design and development of aquaculture projects across Canada and the world. Dave presented an overview of land-based recirculating aquaculture system (RAS) design by highlighting the main considerations that have gone into the variety of small, medium and large aquaculture projects they have been involved with since 2006. Dave discussed several projects including salmon smolt production facilities, a 250 tonne annual production arctic char facility, a mobile hatchery project and a facility designed to facilitate training and skills development in RAS production. Dave also touched on key points such as:

- Stable production through cohort management strategies
- System efficiencies that minimize labour requirements
- Added jobs that the fish processing industry creates
- The importance of effective feeding programs
- The importance of maintaining good water quality to achieve production goals
- How investing in larger systems (e.g. 500 tonne annual production) can be more efficient in terms of the ratio of capital cost to designed production capacity

Next, Tanis Ostermann moderated a panel made up of…

Manitoba aquaculture producers:

Rudy Reimer, Watersong Farms, producer and value-added processor of steelhead trout

Rick McDonald, B&B Freshwater Fish Farm, arctic char hatchery and fingerling producer

Peter Waldner, Ridgeland Aqua Farms, hatchery, and grow-out producer and processor of arctic char

Kristy Smith, Myera Group, producer of arctic char in systems integrated with algae and plant production

Question 1: Who are you and what do you do?

Rudy: Watersong Farms operates the facility that was developed as part of the Manitoba –Canadian Model Aqua-Farm Initiative as a private business producing and processing steelhead trout including adding value by preparing a variety of products in their licensed on-site butcher shop. The system capacity is about 120 tonnes of whole fish per year. Because of the relative immaturity of the industry, it is important to recognize that participating in more than just the fish production part of the industry is required.

Rick: B&B Freshwater Fish Farm started working with arctic char in 2000. Before that, the business used to do rainbow trout and carp fishery/ aquaculture production and marketing. Working with arctic char was traditionally for sale of eyed eggs mainly for export, now the business focuses on fingerling production.

Peter: Ridgeland Aqua Farms has operated a 50 tonne per year artic char production facility since 2007. For most of its history has been producing egg to plate meaning that all phases of production and processing occur on-site. Ridgeland is currently in the process of building a new facility that is designed to produce 200 tonnes of arctic char per year.

Kristy: Myera Group is producing arctic char in a system that integrates fish process water with algae and plant production. Myera works closely with B&B Freshwater Fish Farm and Rick McDonald is mentoring Kristy in fish culture techniques.

Question 2: What is the biggest advantage of being in aquaculture or your favorite thing about it?

Kristy: Opportunity for industry expansion. Newness makes it challenging but profitability is possible.

Peter: Opportunity. Rewarding to succeed in an agriculture industry that is more challenging than others in terms of animal husbandry. Despite challenges, growth of the business has happened in the past 10 years.

Rick: Grew up with pigs. Like the working environment with fish better.

Rudy: Working with animals in a good working environment that is temperature moderated throughout the year. Enjoy the challenges of learning new animal husbandry methods and challenges associated with

production methods including dealing with emergencies like power outages. Also, being engaged in landbased aquaculture is rewarding to educate and see the consumer acceptance of sustainable aquaculture. This has resulted in loyal educated customers and this industry trend will continue.

Question 3: What kind of support would be most beneficial?

Kristy: Supportive regulations for aquaculture operations. Right now, there is confusion and authorities do not always know how or who handles specific issues. There should be more of a coordinated response by authorities when dealing with aquaculture operations.

Rick: Financial support and regulatory reform for fish health related licensing and permitting.

Peter: Government funding support.

Rudy: An Aquaculture Act that recognizes aquaculture as agriculture. Federal- Provincial agriculture programming excludes aquaculture and this is holding back industry growth. Enabling policy and program support would help with many things like training, technology transfer and improving animal husbandry techniques.

Question 4: What is/ would be the most valuable partnership for your business?

Rudy: All aspects of the production chain: Fish hatchery to grow out to processor to marketer.

Rick: Local hatchery to grow-out. Reliance on fingerling imports is not the answer. Regulatory and logistical burden is too high.

Peter: Buyers.

Kristy: Same as Rick.

Panelists also answered questions from the attendees…

Are the market opportunities local? Export? Niche?

Local and export. There is not much competition in the char industry and demand is out there. Allows for price to be set based mostly on cost of production and a good relationship with wholesalers. Certifications and green sustainability rating allow for unique market opportunities through product differentiation.

As the industry grows accessing the export market will be important. Competing only for the local market will drive prices down and the industry will not be economically sustainable. Production in Manitoba is too small to be ready for export market, we need more producers to increase output and avoid market interruption. Overall industry growth potential is in the export market.

There is a market demand for arctic char fingerlings in the U.S.

Costco reported a 40% increase in demand for steelhead trout.

Are certifications like organic a market opportunity for Manitoba aquaculture?

There is a big demand for organic proteins. Canadian organic aquaculture standard exists.

Landbased aquaculture easily achieves green sustainability ratings.

Quality is most important in the market. Conditioning fish by putting them in a purge tank for between 7-12 days improves flesh quality and is very important.

Should producers form a marketing alliance like a co-operative?

The industry is not supply managed which is good for this industry and working together could have great benefits:

- Supply purchasing power
- Help to coordinate fingerling production
- Model after the integration of the Manitoba hog industry
- Collaborative marketing based on quality production standards including using the same techniques and feeds
- Building a Manitoba brand

Are there alternate species that should be considered for Manitoba aquaculture or should the focus remain steelhead trout and arctic char?

Steelhead trout, arctic char maybe other salmonid species are probably best here. Not sure about competing directly in the Atlantic salmon market.

Demand is increasing for steelhead in the approximately 2kg fish market. Definitely room to increase production to serve this market without negatively influencing price.

Arctic char market is limited by supply and Manitoba is suited to grow this species. Knowledge of arctic char aquaculture techniques in Canada is improving.

Production systems are species specific so investments should be made on species that we have the best confidence in being able to be successful with.

It would be hard to compete in markets where there are wild fisheries. Cost of production of fishing is lower than aquaculture.

There are no domestic stocks of alternate species making a reliable source of genetics a challenge.

Even access to trout and char fingerlings can be a challenge. Recently steelhead tout fingerling importation to Manitoba is happening out of necessity. Importation from within Canada is easier from a regulatory perspective than fingerlings coming in from the U.S. but any importation is costly.

Integrated systems like aquaponics can be good but fish production tend not to be the main revenue generators in these systems. High value outputs like nutraceuticals or large volumes of plants tend to make the fish part a smaller part of the business.

Lunch

Chefs at The Merchant Kitchen prepared a plated lunch that featured locally produced fish served in a variety of culinary preparations. This special lunch service was designed to celebrate the high quality products that the industry is providing to consumers. Attendees were able to enjoy the meal together as a group following the morning's presentations to reflect on new perspectives learned about the aquaculture industry in Manitoba.

The first course was…

Cured Steelhead Trout
grilled focaccia, pickled red onion, dill, smoked char rillette, crème fraiche, arugula

The main course was…

Roasted Char
Manitoba honey glaze, crispy onion, warm potato salad, white balsamic reduction, cilantro

And dessert was…

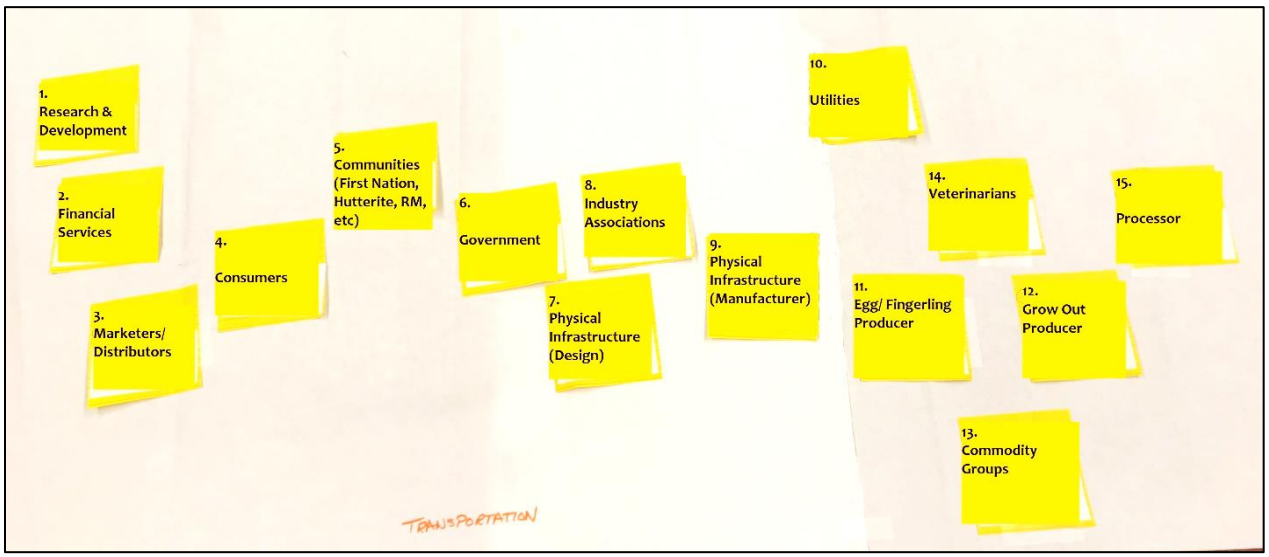
Pistachio Tart
milk & white chocolate, anise caramel, mint syrup, sea salt

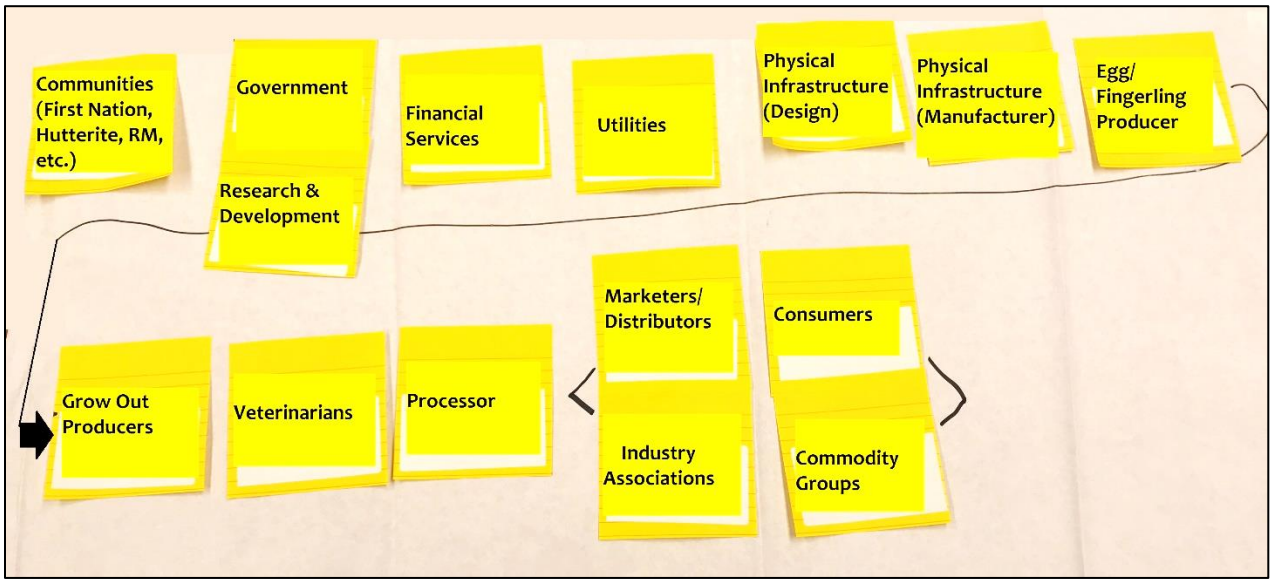
Once dessert was served…

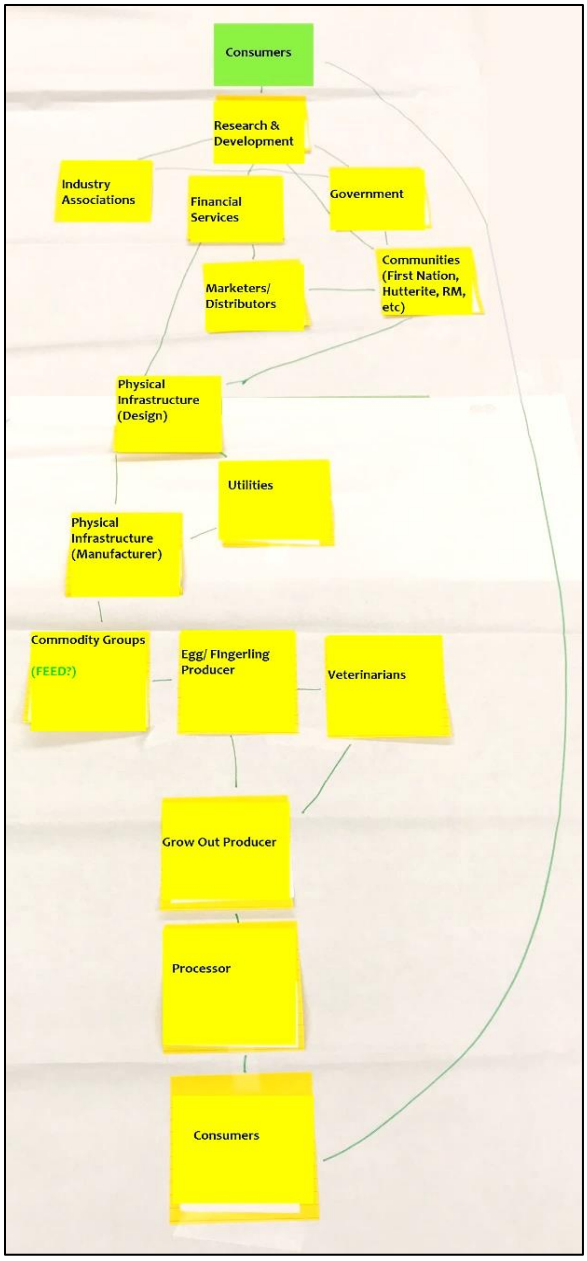
Evan Page, Mariner Neptune Fish and Seafood Company Ltd. delivered a presentation focused on the aquaculture market from the perspective of a company that is engaged in processing and marketing locally produced aquaculture products. Evan discussed the strong demand for fish species like steelhead trout and arctic char including some of the unique positioning with the seafood market that these products have. Mariner Neptune Fish and Seafood Company Ltd. markets and distributes these products as well as other aquaculture products and supports product communication using pre-prepared flyers for each product (flyers are included towards the end of this report). Evan acknowledged that engaging with aquaculture producers is a recent undertaking for the company that has a long history working with fishery products. Although somewhat reluctant to engage, Mariner Neptune now considers aquaculture products a welcome addition, important part of their product offering and encourages more production in Manitoba. Mariner Neptune Fish and Seafood Company Ltd. are available to discuss new business arrangements that support farmers in the capacities of processing and marketing.

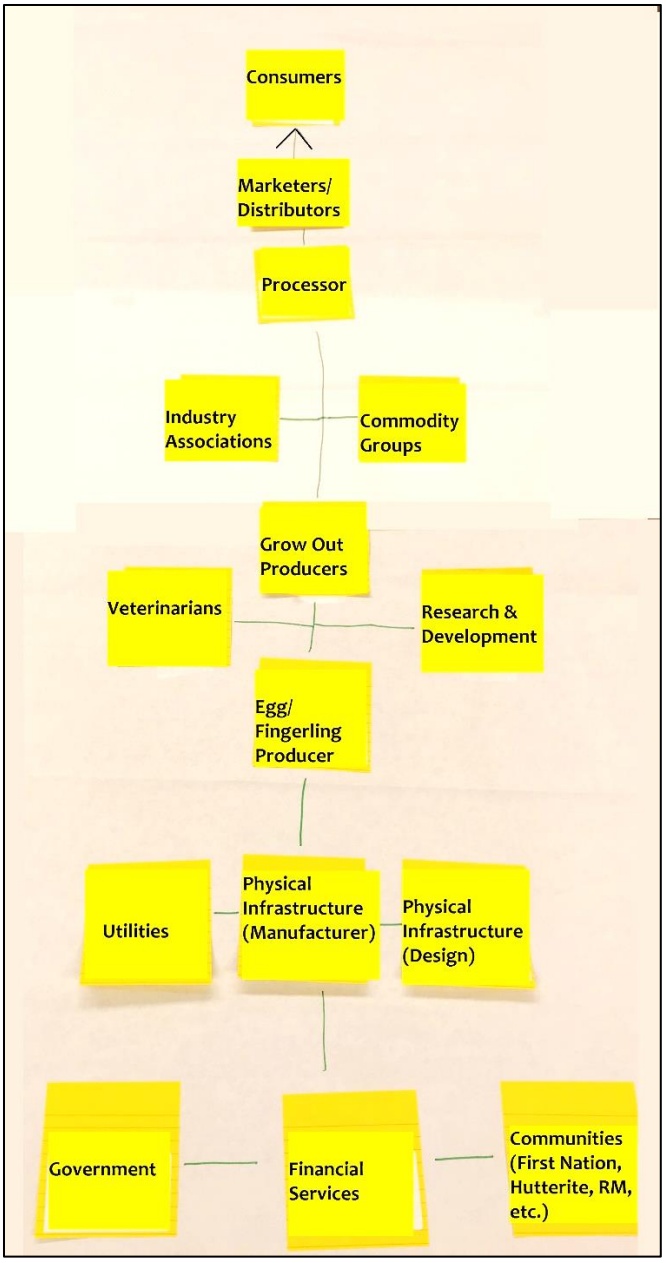
Group Activity 1 – Validating the Value Chain

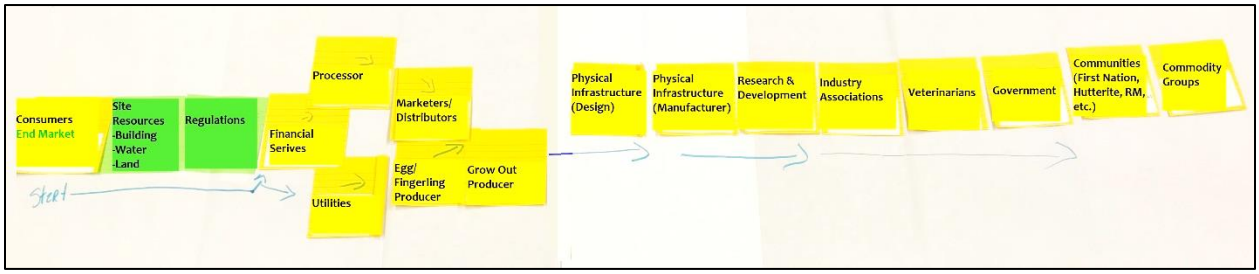
Tanis Ostermann directed attendees to break out into seven groups each at a table arranged throughout the room. The general stages of the Manitoba aquaculture value chain were printed on a set of sticky notes for each table. The groups of attendees were asked to place the sticky notes on pieces of poster paper as they saw fit to illustrate the linkages in the value chain adding in any missing elements. As the groups worked to complete the activity, exploration amongst attendees about where they could fit into the value chain took place. Copies of each groups' work appears in the following images:

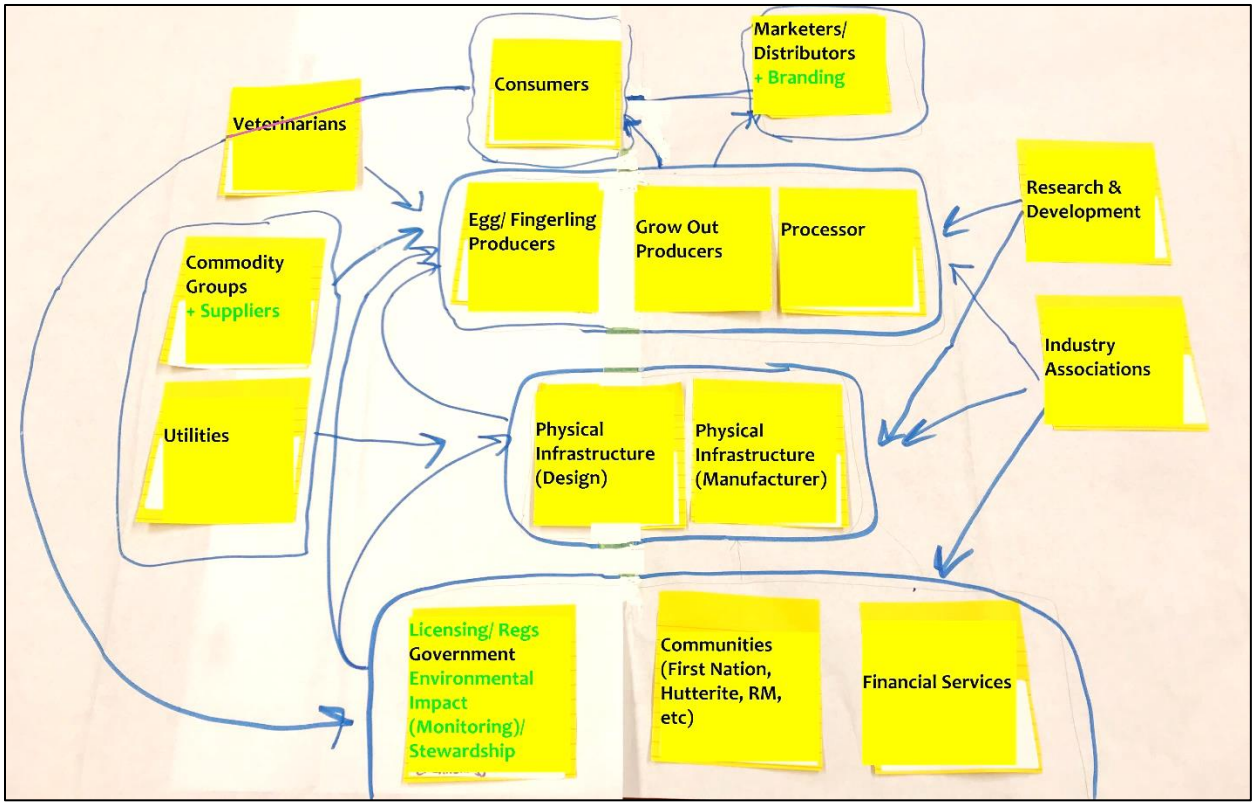


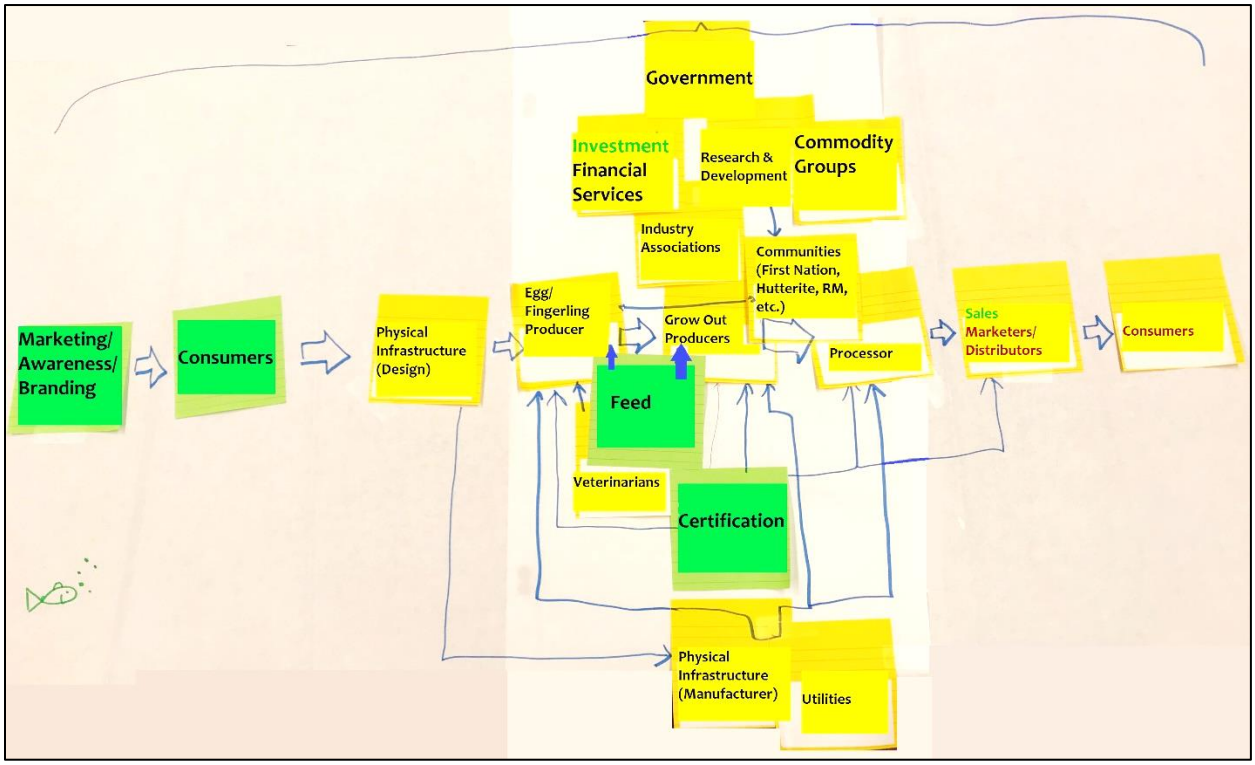



Consumers
Research & Development
Industry Associations
Financial Services
Government
Communities (First Nation, Hutterite, RM, etc)
Marketers/ Distributors
Physical Infrastructure (Design)
Utilities
Physical Infrastructure (Manufacturer)
Commodity Groups
(FEED?)
Egg/ Fingerling Producer
Veterinarians
Grow Out Producer
Processor
Consumers


Consumers
Marketers/ Distributors
Processor
Industry Associations
Commodity Groups
Grow Out Producers
Veterinarians
Research & Development
Egg/ Fingerling Producer
Utilities
Physical Infrastructure (Manufacturer)
Physical Infrastructure (Design)
Government
Financial Services
Communities (First Nation, Hutterite, RM, etc.)


Consumers
End Market
Site
Resources
-Building
-Water
-Land
Regulations
Financial Serives
Processor
Marketers/ Distributors
Egg/ Fingerling Producer
Grow Out Producer
Utilities
Start
Physical Infrastructure (Design)
Physical Infrastructure (Manufacturer)
Research & Development
Industry Associations
Veterinarians
Government
Communities (First Nation, Hutterite, RM, etc.)
Commodity Groups


Consumers
Marketers/ Distributors + Branding
Veterinarians
Research & Development
Egg/ Fingerling Producers
Grow Out Producers
Processor
Commodity Groups + Suppliers
Industry Associations
Utilities
Physical Infrastructure (Design)
Physical Infrastructure (Manufacturer)
Licensing/ Regs Government Environmental Impact (Monitoring)/ Stewardship
Communities (First Nation, Hutterite, RM, etc)
Financial Services


Government
Investment Financial Services
Research & Development
Commodity Groups
Industry Associations
Communities (First Nation, Hutterite, RM, etc.)
Marketing/ Awareness/ Branding
Consumers
Physical Infrastructure (Design)
Egg/ Fingerling Producer
Grow Out Producers
Processor
Sales Marketers/ Distributors
Consumers
Feed
Veterinarians
Certification
Physical Infrastructure (Manufacturer)
Utilities

Group Activity 2 – Untapped Partnerships

Tanis asked that attendees mix up the table groupings and settle in for a group activity that involved each group working together to discuss and agree on two potential partnerships within the aquaculture industry in Manitoba. Partnership was defined as:

"Linkage between two or more parties working towards mutual or reciprocal benefit (win-win scenarios)"

Volunteer scribes documented the ideal vision of the two partnerships that have the most potential to result in an expanded or improved aquaculture market in Manitoba based on the discussions at each table. The groups worked to answer two specific questions:

1. **What partnership could expand or improve aquaculture in Manitoba?**
2. **In an ideal world, what would this partnership look like (what would the characteristics be)?**

Answers to the questions are below:

1. -Partnership between Hatchery and Growout
   -Grower with marketing Department
   -Development of industry association
2. Hatchery → Growout Barn → Marketing

1. Producer Co-op
2. Work together to maintain steady supply to market and set prices to prevent undercutting each other.

1. Between distributor and producer
2. -Consistent stable supply chain, needs are understood which means needs can be met.
   -Cooperation and trust
   -Transparent trade

1. Resource user (i.e. MB Hydro) and the community
2. -Finding common ground
   -MB Hydro: Dams affects water levels & flows
   -Financial partnership

1. Government / Producers → Coop style (voted in not appointed), cooperation and working together like we see in the commercial fishers
2. -Fair
   -Integrity
   -Transparent
   -Trustworthy

1. Government + Entrepreneur
2. Enable business development by reducing unnecessary regulations

1. Producer + Consumer
2. Trust

1. Strong provincial industry association providing a unified voice
2. -Lobby group to increase government support
   -Lobby research and development groups/leverage funding
   -Provide continuous supply chain
   -Interface with FN groups, stakeholders and other community groups

1. Financial Services
2. -Loan guarantee by government
   -Easier access to capital and operating funds

1. Hatchery and Growout producers with the Processor/Marketer
2. -Deep pockets, patience and trust
   -General agreement before production starts

1. Government with industry
2. Long term low rate financing for capital and operating

1. Communications between government departments – intragovernmental and intergovernmental
2. -Working together to advance the industry
   -Where is MB Sustainable Development today?
   -Manitoba Sustainable Development is a barrier to development of industry.
   -CFIA needs to be brought into the conversation as well.

1. Producers grouping together to advance the industry (if you grow the industry will benefit everyone) – Producers, Marketers, and Financers (binding confidence in the industry)
2. -Cooperate – deal with pricing (industry association), all issues the producers are dealing with (with processors, marketers, producers), can develop infrastructure
   -Everyone has to participate/'play nice'
   -Established, rules and guidelines for producers to play by standards/consistent product
   -Advocacy Group
   -Marketing
   -Mutually beneficial

1. Producers and marketers to create awareness, push to create the demand
2. -"Loose" quota system? (having contracts in advance)
   -Create a forward looking contract

1. First Nations, Producers and Investors
2. -Ability to take a lower return on investment
   -International investor opportunities
   -Land and water access to First Nations

Following an afternoon networking and health break…

Group Activity 3 – Challenges & Barriers

Tanis reconvened the group and asked participants to mix up the table groupings again and discuss challenges and barriers facing the industry in Manitoba that relate to different categories of "business":

- Business Development & Support
- Market (entry, access, expansion)
- Resources (money, people etc.)
- Knowledge
- Regulatory
- Production
- Other

During the discussions, attendees were asked to write down challenges specific to each category on sticky notes and attach the notes to poster papers for each category that were placed on the walls around the room. The categories were presented to stimulate ideas but not to limit them. Attendees were encouraged to post any challenges they can think of that might not fit the categories under the "other" category. Attendees were encouraged to identify the challenges, barriers and potential solutions as related to aquaculture development in Manitoba. Input under each category is presented below:

Business Development & Support

- Financial industries lack of knowledge
- No collateral value on production system assets (specialized industry)
- No liability insurance on fish
- Fish stock don't qualify for cash advance
- Not all can access small specific programs
- Lack of support funding for development
- Lack of subsidies for "crop disturbances"
- Unequal funding between aquaculture start ups and agricultural sectors
- Aquaculture is (should be treated as) agriculture
- Central contact needed for all inquiries
- Available financing is a problem
- Access to funding
- Loan guarantees (FCC?)
- Product differentiation "marketing" (general marketing)
- High capital cost
- Market security/ contract/ letter of intent
- Supply chain security

Market (entry, access, expansion)

- More development of end markets (expand)
- Need to have reliable and consistent buyers
- Blind trust of prominent public figures with no research/ verification
- Inconsistent consumer trust with regard to food products
- Better promotion is needed
- “Fake news” and public acceptance
- Not a lot of reactive measures to counter inaccurate information
- Need to have secure stable market, need a reliable supply in order to have stable markets, need to work together
- Price differentiation between farmed fish and wild fish
- Accessing info about marketing/ markets
- Consumer awareness/ education
- Overcome perceptions regarding farmed vs. wild fish
- Steady supply to distributors (maintain market)
- Consistent quality
- Brand marketing/ social media
- Consumer trust/ education/ awareness
- Sell fish a year in advance before you get them
- Keeping them alive
- Need consistency of product
- Need consistent supply

Resources (money, people, etc.)

- Planning and development: Tapping into access to qualified labour
- Water, quality water access
- Water use permits
- Establishing a co-op
- Federal and Provincial funding
- Business plan development
- Industry association funding
- Lack of funding: Need government guarantee on capital and operating loans
- Lack of commodity supply on short notice
- Funding
- Experienced people
- Transportation
- Industry association/ co-ops
- Vet support/ fish health support
- Federal support

- Experienced people
- Most “coastal” land is crown owned and not available to purchase/ acquire
- Unnecessary water quality testing costs a lot of money to demonstrate little to no change from source output
- Encourage participation in fish production from existing intensive livestock producers (eg. Hylife)
- Co-op!

Knowledge

- You’ve got people who know how to keep fish alive but struggle with business management
- Customer “trust” due to lack of knowledge
- Positive public relations of fish farming perception
- Not a lot of resources to draw on within the industry
- Manitoba information is not useful, better info/ more up to date elsewhere (eg. U.S.A.)
- Manitoba information documentation available on websites is horribly out of date
- No links to relevant info from other jurisdictions
- Lack of knowledge of aquaculture industry by consumers particularly about RAS
- Need training facility for aquaculture apprenticeship program
- Encourage mentorship opportunities for new potential producers with existing producers
- Build a training and skills development farm like what was planned at Huntsman Marine Sciences Centre
- When things go wrong it costs money, always happens Friday afternoon before a long weekend
- Learn to do by doing
- Lack of practical knowledge amongst regulators and educators
- Limited players with lots of experience
- “Aqua-shysters”- companies promoting their high cost products with little benefit to producers
- Consumer knowledge/ education
- Research and Development (genetics, technology, product support)

Regulatory

- There needs to be clearer rules and processes defined by Government
- Need a unified voice – lobbying
- Inconsistent government standards
- Difficult to access information from government departments
- Difficult to find the correct person to ask
- Staff not always helpful of knowledgeable
- If you’d like to speak to a live person press “1”, press “76256” – Frustrating!
- Manitoba Sustainable development in not supportive of the industry (not familiar with the industry)
- Need faster action and cooperation from government
- Disconnect between different regulatory bodies

- Lack of structure
- Lack of Aquaculture Act; any “current” legislation is very dated
- Regulators lack knowledge/ certainty: Fear to act
- Lack of coordination between levels of government and jurisdictions and countries
- Concern with over-regulation
- Transportation regulations
- Import and export regulation are out of line
- Premises inspections and lot inspections are too expensive
- Individual interpretations are not consistent

Production

- Infrastructure, land, buildings
- Finances/ capital regardless if you have a building or new build
- Utility cost or access to operate
- Capitalization costs
- Lack of trained personnel to do the work (management included)
- Lack of local feed supplier
- Lack of primary equipment and expertise in equipment repair
- It is a long production cycle = cash flow issues
- No insurance
- RAS is fragile
- Constant monitoring/ fragile environment
- Secure broodstock/ egg supply; close proximity
- Fish health (vets); testing (timely turn-around)
- Infrastructure Water supply, treatment, effluent treatment
- Model farm concept needed
- Feed: local production or transport subsidies
- Unclear who to go to or where to get info on how to produce fish; how to identify health issues
- Ensure reliable access to quality genetics

Other

- Cost of feed
- Access to feed (local)
- Costs associated with transportation
- Reliability of transportation
- Cross border trade/ export
- Lack of private processors
- Access to fingerlings (hatcheries)
- No voice to advocate for the industry to address any regulatory issues (or any other issues)

The final activity of the day was…

Group Activity 4 – Next Steps

Tanis indicated that each attendee should reflect on the day and articulate their individual next steps in the industry and what the overall next steps for the industry should be. The format for the activity was to provide written response to a short "survey" and submit before departing the event. Responses to the "survey" are compiled below:

On a scale of 1 to 5, how valuable have you found this event?

1 (minimal value)	-	0
2	-	0
3	-	3
3.5	-	1
4	-	10
5 (highest value)	-	8
No scores	-	3

Please describe any specific aquaculture partnerships and relationships you intend to pursue.

- Well I hope to continue to keep in contact with the groups I met and work with all stakeholders to continue to grow the industry in Manitoba as there is so much potential.
- I believe there is plenty of potential for partnership with interested Aboriginal Communities and non-indigenous groups, with the right partnership struck it would be tough to find a better balance and recipe towards a stronger future in aquaculture within the industry. Need to ensure conversations are continued and momentum is used following this event.
- We intend to pursue relationships with businesses who intend to build aquaculture facilities here in Manitoba, as well as, First Nation groups thinking of getting into this business.
- Possible entry into the industry as a producer and knowledge research/seeking for aqua-health.
- Continue to liaise with Jeff to follow the development of the industry.
- Find partners with banks and government to get funding and permits for my land based fish farm.
- As a person/group just starting and looking into aquaculture industry, we are looking at all partnerships or relationships that we can.
- With government bodies and distributors.
- With the industry people here in attendance (all of them) and some new players.
- I would like to follow up with the other producers to try to open up communications more to learn more about how to address our challenges.
- Financial services industry
- Manitoba sourced food ingredients.
- Myera
- Stay involved with those currently in the aquaculture industry.
- Look to some of the existing producers for expansion opportunities.
- Growing trout and char

- Would like Manitoba producers to engage in national sector networking opportunities (e.g. CAIA, AAC).
- Working in industry associations and trying to move this conversation forward.
- Connecting with supply chain (e.g. Cargill).
- Every one I can take advantage of to achieve our goals.
- I have a hatchery – intend to partner with a grow-out.
- Aquaculture Co-op
- Expansion of hatchery – grow-out ponds, and production area.
- Set up a good relationship with a reputable marketer.
- I intend to just keep the relationships I have.
- Continue to express interest to Swine Health Professionals demonstrating the need for veterinary expertise around fish health in Manitoba.

What do you think the biggest opportunities are, with respect to the aquaculture sector in Manitoba?

- Trout, Char and Whitefish. Trout could easily feed into the Ontario and USA market, Char is similar. Whitefish is traditional fish to Aboriginal communities, which is currently in decline nearly everywhere. This species is perfect for growing in the northern climates and could be great fit. This species could easily fill a gap that is soon to be more and more evident, especially as the demand continues to grow. Support services (hatcher-fingerling producers) and egg suppliers would be key with this expansion as a lot of "complaints" were surrounding supply issues and regulatory.
- There is a big opportunity for the provincial government to assist the sector financially. Getting capital from investors or banks is a big issue. Loan guarantees from the government or interest free loans would help.
- Producer cooperatives to invest in feed manufacturing and sale of water effluent by-products.
- Cooperative for fingerling production and genetic breeding in Manitoba.
- Increase supply of fish for consumers and partnering with the financial service and distributor.
- Provincial lab diagnostics support.
- Given the natural areas, water and farm, high potential for growth of the FM.
- Producing steelhead and char in land based facilities.
- New and exciting opportunity for Manitoba.
- Its relatively undeveloped.
- Net pen aquaculture.
- Other species -shrimp?
- Central location in Canada, access to Centerport; relatively good water; sort of established arctic char hatchery with consistent supply of eggs and fingerlings.
- To build a sustainable protein supply.
- Our natural resources such as water.
- Connection with health and economic development.
- Limited due to the inherent risk with production and farming.
- Risk is too high.
- Market is there.
- Primary and feed production.
- Nobody at the moment.
- First Nations – led net pen production.

- The fact that this is emerging industry and the opportunity for new, expanding business.
- Marketing opportunities for Manitoba farmers.
- Farm diversification
- Feed opportunities
- That it is a new and developing market with lots of opportunity.
- Have the opportunity to sell live fish.
- High demand / low supply
- The fact that more of the supplier, producer and marketers are getting involved could be very good for Manitoba aquaculture.
- There are lots of room for opportunities.
- From the discussion and presentations, there appears to be a wealth of opportunities in the province. My attendance at the conference was primarily to learn more about what aquaculture exists in the province, find any commonalities/network with other aquaculture producers in the province to become more aware of what resources we can draw upon for out Lake Sturgeon and Walleye conservation stocking programs.

With respect to your own aquaculture involvement, if there was one thing you could get help with what would it be?

- Specifically, to my role that I act in is access to more impactful funds. I am sure this is the same as everyone. It's not a matter of needing to prove the market, it's a matter of gaining the funds to capitalize on the opportunities.
- More programs for indigenous and non to participate in more aquaculture programs geared towards aquaculture would be very impactful to the industry, especially when we are trying to grow the industry.
- Getting contacts with people (from 1st question) would be the biggest help.
- Increase fish husbandry and health.
- Increase in knowledge for breeding stock and genetic selection.
- Booklet of producers and potential producers which would include list of suppliers that would pay to advertise and help pay for the booklet.
- Funding or financing for design of concept plans and business plans to evaluate opportunities.
- Financing
- Regulations
- Networking need more opportunities to network and industry.
- Should have invited insurance providers and more indigenous people.
- Reduce red tape.
- To further understand the connectivity and interactions of all the players within the industry.
- Partnerships with health and Ag innovation.
- Consistent regulations that are practical and affordable (if cost associated with requirement).
- Recirculating aquaculture production systems.
- Talk to your peers.
- Help to prove the opportunity. Solid numbers for the bankers, ability to know there will be somewhere to sell production long term.
- Marketing
- More information for producers – producer information, marketing information, regulatory requirements.
- Health permit certification

- Marine biologist with a specialization in diagnosing disease in an RAS.
- Financial support for our industry would help. Aquaculture is like the uncle no one wants to talk about when it comes to financing.
- Government funding.
- Vet expertise and technical training

Final remarks *were given by Tanis and Jeff Eastman…*

Attendees were thanked for their participation in the event, encouraged to remain interested and involved in the ongoing development of the aquaculture industry in Manitoba. The development of the industry will only happen through engagement by diverse people who are able to embrace change and innovative thinking. Spawning Aquaculture 2.0 is a positive step towards enabling growth of the aquaculture industry in Manitoba through collaboration across the vale chain.

Agenda

Spawning Aquaculture 2.0

Friday, March 2, 2018

Violet-Fuchsia Room, 8th floor Alt Hotel Winnipeg, 310 Donald Street

Agenda

Time	Item
8:15	*Sign-in and Continental Breakfast*
9:00	Welcome and Introductory Remarks – Tanis Ostermann, ***CanSustain***
9:10	Manitoba Aquaculture Industry Overview – Jeff Eastman, Manitoba Agriculture
9:45	Links to Prairie Aquaculture and Fisheries & Oceans Canada – Mandy Light, Fisheries & Oceans Canada
10:00	*Break - refreshments and snacks*
10:15	Production System Design and Requirements for Land Based Aquaculture – Dave Stevens, Silk Stevens Limited
11:00	Manitoba Aquaculture Producer Panel – B&B Freshwater Fish Farm, Myera Group, Ridgeland Aqua Farms, Watersong Farms
12:00	*Lunch – Featuring locally produced Manitoba fish*
12:30	Aquaculture Market Outlook – Mariner Neptune Fish and Seafood Company Ltd. (Lunch presentation)
1:15	Validating the Value Chain – Moderated Group Activity (breakout table discussions)
2:00	Untapped Partnerships – Moderated Group Activity (breakout table discussions)
2:30	*Break - refreshments and snacks)*
3:00	Challenges and Barriers – Moderated Group Activity (breakout table discussions)
4:00	Next Steps – Moderated Group Activity (whole group)
4:15	Closing Remarks
4:30	*End of meeting. Opportunities for informal networking*

Participant list

Name	Affiliation
Tanis Ostermann	CanSustain
Jeff Eastman	Manitoba Agriculture
Amy Johnston	Manitoba Agriculture
Gliadine May Ruam	Manitoba Agriculture
Bruce Hardy	Myera Group
Dave Stevens	Silk Stevens
Evan Page	Mariner Neptune
Jeff Tully	Watersong Farms
Julie Tuk	Mariner Neptune
Kelly Page	Mariner Neptune
Kevin Hill	Dept of Fisheries & Oceans Canada
Kristy Smith	Myera Group
Lorna Hendrickson	Dept of Fisheries & Oceans Canada
Mandy Light	Dept of Fisheries & Oceans Canada
Mark Waldner	Ridgeland Aqua Farms
Peter Waldner	Ridgeland Aqua Farms
Rick McDonald	B&B Freshwater Fish Farm
Rudy Reimer	Watersong Farms
Alanna Gray	Keystone Agricultural Producers
Stephanie Backhouse	Manitoba Hydro
Damon Johnston	Aboriginal Council of Winnipeg Inc.
Nicholas Huber	Waubetek Business Development Corp. Inc.
Tim Kennedy	Canadian Aquaculture Industry Alliance
Gage Lowry	Mukwa
Jennifer Demare	Swine Health Professionals
Kathryn Currah	Manitoba Rainbow Trout Farmers Association
Bob Currah	Manitoba Rainbow Trout Farmers Association
Stephen Boyd	Winnemuller Fish Farms
Jason Winnemuller	Winnemuller Fish Farms
Robyn Wozney	First Peoples Economic Growth Fund
Murray Olafson	Canadian Fish Guys
Howard Plett	Two Fish Pond
Justin Plett	Two Fish Pond
Phil Crossland	Independent Fish Co.
Gary Taylor	Skretting Canada/Nutreco
Joel Alo	SNC - Lavalin Inc.
Darren Bond	Manitoba Agriculture
Dustin Williams	Ash Haven Farms Ltd.
Gerard Lawrence D'Souza	TD Agriculture Services
Dan Kosc	Canadian Sustainable Products Ltd.
Dustin Wiebe	Apex Farms
Travis Wiebe	Apex Farms
Dana Sachvie	Cargill Ltd.
Eva Luk	Wildnorth Fishery Limited
Brad Day	Manitoba Agricultural Services Corp.
Bruce Wachal	Epsilon Arctic Glacier Aquaculture
Ketie Sandhu	Manitoba Agriculture
Hilmar Johnson	
Lyle Morrisseau	Keego Manitou

Presentations

Sustainable Aquaculture Development: The Manitoba context

Manitoba

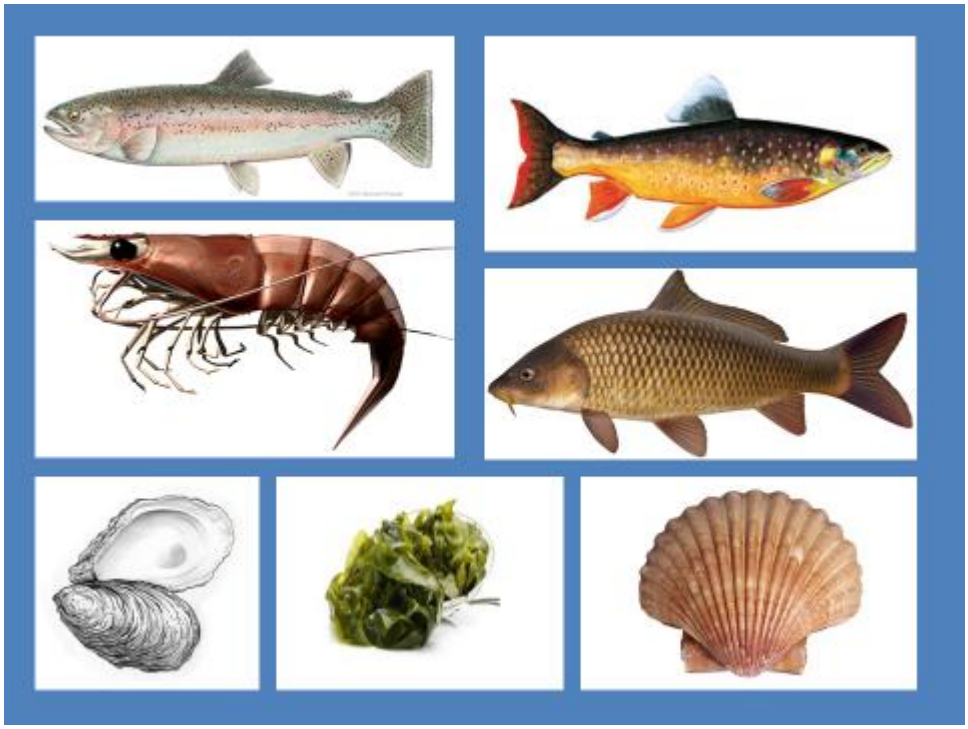
Sustainable Aquaculture Development: The Manitoba context

Spawning Aquaculture 2.0

March 2, 2018

Alt Hotel, Winnipeg

Jeff Eastman, P.Ag. Industry Development Specialist – Aquaculture | Manitoba Agriculture



The FAO on Aquaculture

Aquaculture is "**the farming of aquatic organisms including fish, mollusks, crustaceans and aquatic plants. It also implies the ownership of the stock being cultivated.**"

Aquaculture is the fastest growing food production industry worldwide

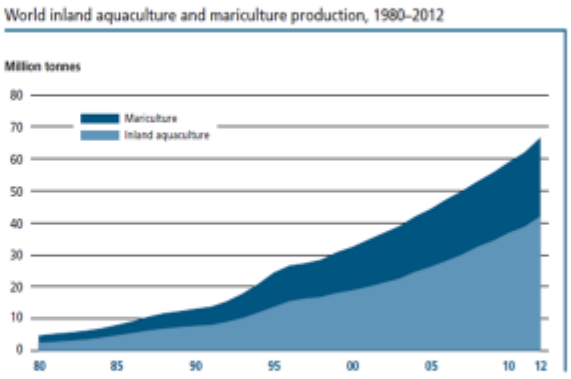
The demand for fish and fish products is escalating rapidly

More than half of the fish products eaten today are products of fish farming worldwide, and the percentage will continue to rise as the population increases and production from the ocean stabilizes or decreases.

Opportunity for us?

Aquaculture is the fastest growing food production industry world wide

- The demand for seafood is driving aquaculture's growth
- A growing global population and a planet with limited resources makes seafood an attractive option because it is efficient at converting feed to protein
- An attraction to the health benefits and product diversity of eating seafood is also driving demand

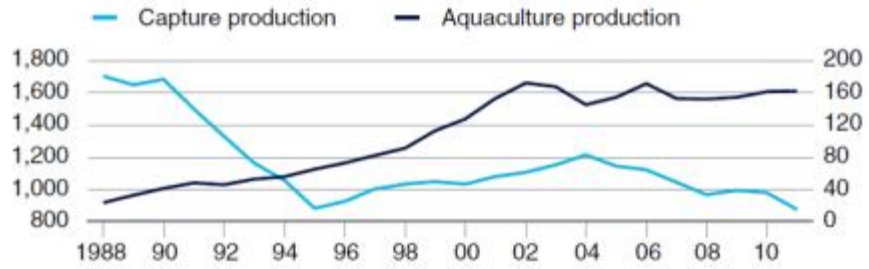


- By 2050, for global fish availability to meet projected demand it is estimated that aquaculture production will need to more than double, rising from 67 MT to roughly 140 MT (World Resources Institute – 2014).

Chart courtesy of: FAO: The State of World Fisheries and Aquaculture - 2014

Seafood production in Canada

Annual Canadian Capture and Aquaculture Production
(tonnes, 000s)

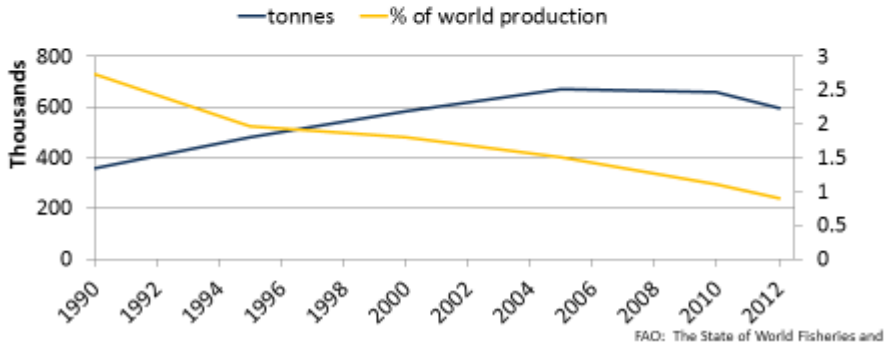


-The Conference Board of Canada:
Strengthening Canada's Commercial Fisheries and Aquaculture From Fin to Fork, 2014

North American aquaculture lagging on the global stage

- In sharp contrast to other regions, aquaculture production in North America started to shrink gradually from 2005 and, by 2012, was lower than in 2000, owing mostly to the production fall in the United States but not helped by ongoing stagnation in Canada.

*Canada makes up about ¼ of North American aquaculture production (circa 2012)



FAO: The State of World Fisheries and Aquaculture - 2014

The Conference Board of Canada: Strengthening Canada's Commercial Fisheries and Aquaculture From Fin to Fork

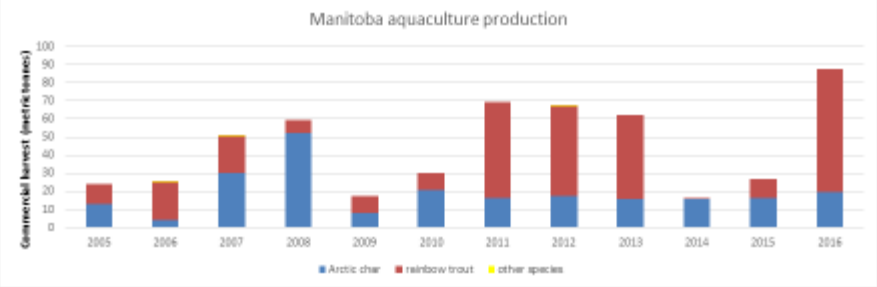
- **Aquaculture offers particularly promising economic growth opportunities**
- **A willingness to engage and embrace change is paramount**
- Increasing aquaculture production depends on improvements in policy, laws and regulations; feed efficiency gains; the development and sharing of innovation, technology, and best practices; the protection of the environment; and marketing and branding.
- Success will depend on shifting the focus and pressure away from maximizing volumes and towards maximizing value
- Lagging behind all other food manufacturing sectors, seafood industry in Canada invests less in R&D due largely to a lack of program support
- Aquaculture remains undefined in Canadian law. New Brunswick and Newfoundland are the first provinces to establish an Aquaculture Act allowing a more strategic approach to aquaculture management and development
- Sustainability branding, pan-Canadian and foreign promotion and branding efforts would be welcome

-The Conference Board of Canada:
Strengthening Canada's Commercial Fisheries and Aquaculture From Fin to Fork, 2014

The nuts and bolts of the Manitoba situation

Manitoba Aquaculture Overview

- Aquaculture operations in Manitoba include pond culture and landbased systems
- There is currently no cage culture in Manitoba
- Rainbow trout (aka Steelhead) and Arctic char are the main species produced
- Manitoba's contribution to Canada's freshwater aquaculture production is less than 1%
- Reported annual harvest has never exceeded 90 metric tonnes
- Processing takes place locally including production of value-added food products
- Aquaculture products are consumed locally, in Western Canada and have entered the USA market
- The level of production is not at all commensurate with the opportunity that exists



Spawning Aquaculture Stakeholder conference

November 25, 2005

- Goals:

1. To assess opportunities and challenges for aquaculture in Manitoba
2. To conduct an assessment of specific infrastructure requirements
3. To discuss and action plan for moving forward

- Key recommendations:

1. Formation of a Producers Association for the Aquaculture Sector
2. Manitoba Agriculture become the lead public sector organization in support of aquaculture
3. Provide a clear and comprehensive regulatory framework on water supply, effluent management and other environmental issues
4. Stocker and inventory financing
5. Develop low cost feed alternatives

Aquaculture is the fastest growing food production industry worldwide.
The demand for fish and fish products is escalating rapidly.

Manitoba seems well positioned to develop a sustainable aquaculture industry:

Inherent advantages	Challenges facing development
• Farming expertise • Agricultural sector looking to diversify • Relatively low cost energy • Existing processing capacity that could benefit from steady production • Abundance of high quality freshwater • Central location in terms of markets • Vacant PMU/ hog barns that could be converted to indoor aquaculture facilities	• Lack of knowledge/ practical experience • Need for aquaculture support sectors • Absence of local fish feed supply • Developing 'smart' regulations and programming • Financing • Lack of infrastructure

Manitoba Agriculture's Aquaculture Extension; Industry Development Service has made progress since 2007 towards addressing the needs and overcoming some of the challenges by capitalizing on Manitoba's advantages

MB Ag Aquaculture Extension and Industry Development service

PURPOSE OF THE SERVICE

- To provide technical production, management, and value added information with the goal of developing a viable and profitable aquaculture industry in Manitoba.

AVAILABLE BENEFITS/ ASSISTANCE

- Assistance in evaluation and development of production and value added opportunities for individual producers, groups and industry including the preparation and distribution of information via factsheets and WWW Information, business planning and analysis, development and delivery of workshops and seminars, and cooperation in developing demonstration and training projects.

Regulatory considerations

ACTIVITY	TYPE OF LICENSE, PERMIT or APPROVAL
Fish farming (commercial aquaculture)	Fish Farming license
Water use	Water rights license
Water discharge	Discharge permit
Environmental impact on surroundings	Environmental approval
Fish processing	Processing facility registration
Importing live fish or fish eggs	Import permit
Miscellaneous	Local government support (eg. R.M., town)

Improvements since 2005

- Manitoba – Canadian Model Aqua-Farm Initiative:
  - Demonstrated technical feasibility,
  - provided further evidence of economic feasibility,
  - improved knowledge base,
  - reinforced understanding of challenges
- Ridgeland Aqua-Farm:
  - A success in organic growth despite challenging conditions
- B&B Freshwater Fish:
  - Building industry capacity in key hatchery support sector
- Industry has continued to advance in the areas of technology, feeds, marketing etc. and... Prices are improving!

MANITOBA – CANADIAN MODEL AQUA-FARM LAYOUT

Complete site analysis and development plan	√
Secure all necessary permits and licences	√
Complete construction	√
Begin production	√
Implement monitoring program	√
Achieve steady-state production	X
Successfully harvest and market fish	√

MB Ag - Aquaculture Site Assessment Program

- Developed to standardize client consultations
- Developed based on results of the M-CMAF

- Understand limitations to scope and scale
- Puts all relevant information in one place
- Targets information gaps and next steps
- Lays foundation for development planning

Natural features	Infrastructure
Groundwater available	Buildings
Drainage potential	Power supply
Soil composition	Water supply
Other considerations	Ponds
	Useful infrastructure

Practical learning at the M-CMAF

- Effective integration of the most current technologies including **operational practices and standards** was key to the M-CMAF.
- **Protocols and SOPs** were developed for all routine and non-routine management activities

Fish Farm Technical Training Manual

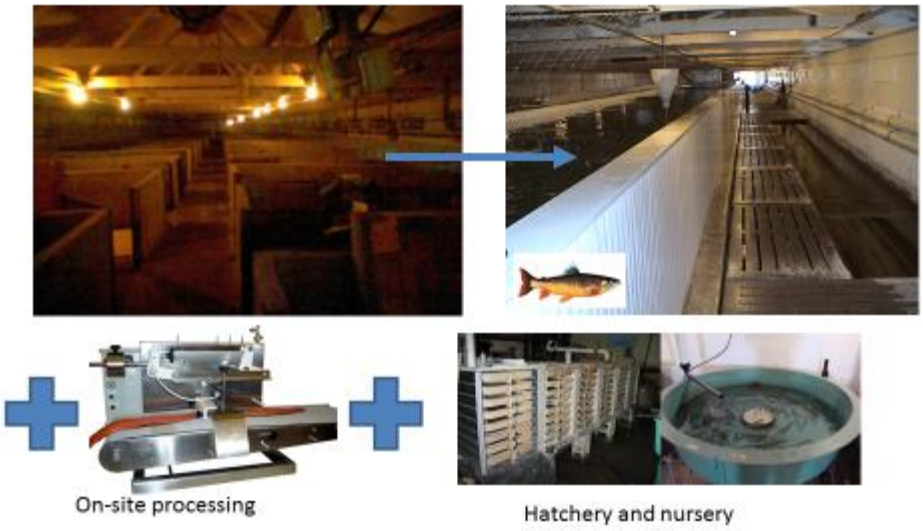
System start-up	Daily operations
Equipment and maintenance	Feeding, growth tracking and sampling
Water quality monitoring	Effluent management
Biosecurity and fish health	Emergency response
Licenses and permits	Harvest and marketing

Aquaculture Cost of Production guide

- Provides planning information and a format for calculating COP for aquaculture grow out in MB
- Based on well designed continuous production RAS for cool water aquaculture
- Ramp-up period of building inventory towards steady-state

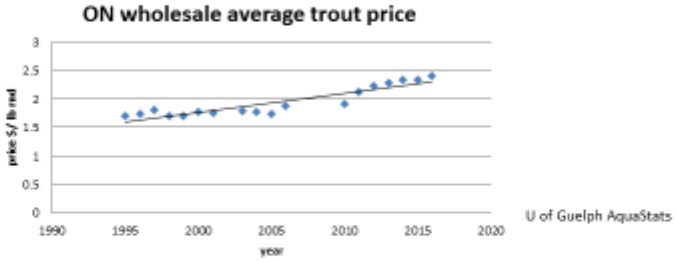
- Based on 4 cohort production plan
- Operating costs, fixed costs and labour are used to calculate profitability and breakeven
- Modelled for rainbow trout growth at 14-15 degrees C
- Model suggests that ROI could be ~7%

Hog barn conversion at the Ridgeland Colony

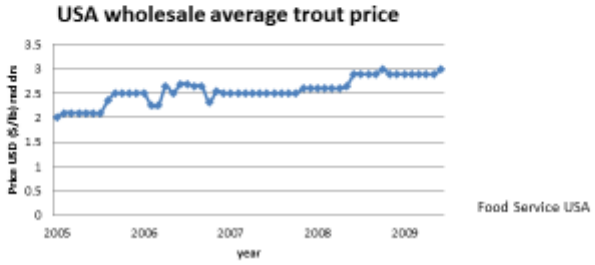


B&B Freshwater Fish hatchery expansion project

Market price trends



U of Guelph AquaStats



Food Service USA

Where we are now... At a crossroads

- Production is possible and happening. Support businesses are insufficient causing a decrease in industry competitiveness
- Industry champions could stabilize the industry
- Evidence of some existing business taking on being a stabilizing force. They are doing this because they recognize the opportunity to grow their business.
- MB is well suited to host a trout/ char sector in part because the sector can be viable at a smaller scale than big protein industries (eg. beef, even pork).
- We can create an industry that are price makers not price takers by adding value right here in Manitoba.

How do we seize the opportunity?

Aquaculture is Agriculture

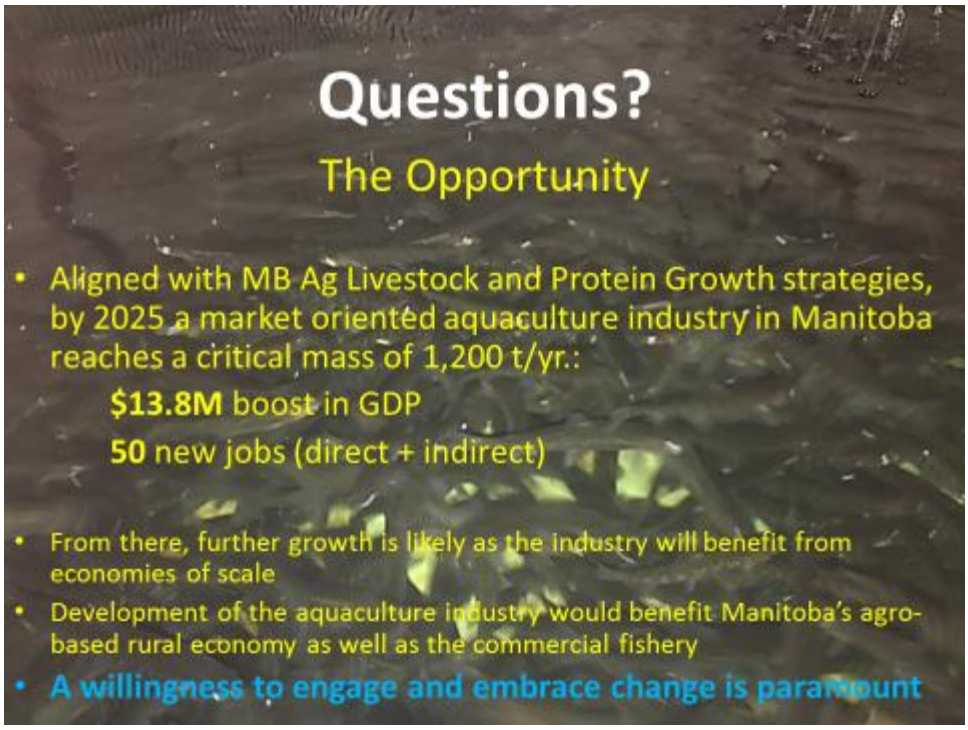
- Economic development in the aquaculture sector is enabled when following the agriculture model well established and understood in Manitoba especially by current industry participants, MB industry groups such as KAP, regional AAFC, Manitoba Agriculture etc.
- Benefits from accessible connections to transportation, food processing and finance sectors for the overall agriculture industry in Manitoba
- Benefits greatly from stabilizing forces that can ease financing constraints and provide supply chain coordination

Investment in the sector

- Investors need to be informed on production systems, markets, resource availability, general business support
- Services and programs offered by government
- Post-investment aftercare: Expertise in local law, taxation, labour, construction & technology
- Investment incentives that compensate the investor for capital costs and serve to stimulate private sector interest: investment grants, corporate tax credits (investment credits)

Developmental Activities

- A thorough economic potential analysis
- Manitoba Aquaculture development strategy
- Spatial planning initiative
- Marketing strategy (value-chain approach)
- Diversification Centre/ Centre of Excellence
- Further indigenous involvement


Questions?
The Opportunity
• Aligned with MB Ag Livestock and Protein Growth strategies, by 2025 a market oriented aquaculture industry in Manitoba reaches a critical mass of 1,200 t/yr.:
$13.8M boost in GDP
50 new jobs (direct + indirect)
• From there, further growth is likely as the industry will benefit from economies of scale
• Development of the aquaculture industry would benefit Manitoba's agro-based rural economy as well as the commercial fishery
• A willingness to engage and embrace change is paramount

Links to Prairie Aquaculture & Fisheries & Oceans Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

DFO's Sustainable Aquaculture Program

- Canada's aquaculture industry is increasingly important to our economy, now contributing more than $2 billion in total economic activity
  - 20% of Canada's total seafood production
  - 1/3 of Canada's total seafood value
- With an initial investment of $70 million, the Government of Canada established the SAP program in 2008 to enhance the sustainable development of Canada's aquaculture industry.
- In 2013, SAP II received $54 million to help address the sector's challenges to growth by:
  - streamlining regulations,
  - improving regulatory management,
  - increasing scientific knowledge and science-based decision-making, and
  - ensuring transparency through enhanced public reporting.

2 Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

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Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

2) Potential Aquaculture Act for Canada

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

Why an Aquaculture Act?

- Aquaculture in Canada is regulated at the federal level by Fisheries and Oceans Canada under the *Fisheries Act;* legislation initially designed for capture fisheries.
- Currently, six other federal departments play a role in regulating aquaculture (e.g., Transport Canada).
- Some stakeholders have been requesting an aquaculture act for years.
- Recently, a senate committee studied aquaculture across Canada, as well as Norway and Scotland, and recommended that the federal government pursue the development of an aquaculture act.
- In response to this recommendation, the federal government has committed to explore aquaculture legislative reform options – including the development of an aquaculture act.

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

Legislative Reform

- The Government of Canada's perspective is that new legislation regarding aquaculture should:
  - clarify federal roles and responsibilities;
  - increase transparency and accountability, which will help improve public perceptions of aquaculture.
- In June 2017, federal, provincial, and territorial ministers responsible for aquaculture agreed that a potential aquaculture act should address the above but also:
  - be compatible with provincial/territorial acts and regulations;
  - respect Indigenous peoples of Canada.

Canada

Fisheries and Oceans Canada / Pêches et Océans Canada

Input to the Process

Aquaculture is a growing and changing industry in Canada.

As the industry evolves, the Government of Canada is looking at how our regulatory system should adapt in order to protect the environment, strengthen the industry and provide employment opportunities for Canadians.

We want to hear your views on:

- The benefits of an aquaculture act in Canada?
- What implications or issues should be considered?
- How do we define aquaculture?

Canada

Fisheries and Oceans Canada / Pêches et Océans Canada

Short Term Road Map

Winter 2017/18

- Fisheries and Oceans Canada will continue to engage with stakeholders across the country.
- If you have any comments or questions please e-mail: AquacultureConsultations.XMAR@dfo-mpo.gc.ca

Summer 2018

- A report will be prepared for the next meeting of the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM) based on comments received.
- Further engagement and consultations will be conducted if the federal government decides to develop an aquaculture act.

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

3) FISHERIES AND AQUACULTURE CLEAN TECHNOLOGY ADOPTION PROGAM

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

What is the program?

- The **Fisheries and Aquaculture Clean Technology Adoption Program** (FACTAP) is a national contributions program which is investing up to $20M over four years (2017-2021).
  - Aims to encourage the Canadian fisheries and aquaculture industries to use clean technologies and measures, without incurring large financial risks.
  - The long-term goal is to reduce the potential environment impacts of their activities.
- FACTAP offers funding to assist the adoption of market-ready clean technologies, processes, and/or sustainable practices in the day-to-day operations of aquaculture facilities and wild capture harvesting.
  - This includes changes or modifications (e.g., adaptation) of technologies, processes, and/or sustainable practices in order to use them operational in the Canadian context.

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

Who is eligible?

To be eligible, you must be active in or support activities related to, the fish and seafood sectors like:

- harvesting
- aquaculture
- processing

You must also be one of the following:

- a commercial enterprise, including:
  - companies
  - individuals (self-employed)
- an Indigenous organization, such as:
  - groups
  - associations
  - communities
- an industry or professional association

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

How much funding can I receive?

- **Up to 90%** from government sources. Of this:
  - FACTAP will provide cash funding for **up to 75%** of eligible project costs.
  - A **minimum of 10%** of project funding must be provided by a provincial and/or territorial government as cash or in-kind.
  - The remaining **5%** of can come from another federal department, agency, or program, or provincial, territorial, or municipal government.
- The remaining **10%** that is not covered by government funding is the responsibility of the applicant.

Source	Percentage	Type	Notes
DFO FACTAP	Up to 75%	Cash	Total government funding cannot exceed 90%
Provincial/Territorial	Minimum 10%	Cash or In-Kind	
Other Government	5% (more if FACTAP funding is less than 75%)	Cash or In-Kind	
Other Sources (including applicant)	Minimum 10% (more if government sources are less than 90%)	Cash or In-Kind	

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

How do I apply for funding?

To assess eligibility for funding, the Program uses two documents:

- Application Form
- Project Proposal Template

This approach provides the option of following a 2-step process to apply for funding.

- Step 1: Expression of Interest
- Step 2: Complete Project Proposal

To support this process, there are three regional program coordinators (RPC).

NOTES:

1. Applications will be accepted on an ongoing basis, which means you can apply at any time.
2. If all available funding for the fiscal year has been given out, proposals may be considered when funding becomes available again in the next fiscal year.
3. All information and documents needed to apply for funding are found on DFO's website.

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

Who can I contact?

Contact information varies depending on where you are applying:

- NS, NB, PEI, NL
  - DFO.ATL.FACTAP-PATTPA.ATL.MPO@dfo-mpo.gc.ca
- **QC, ON, MB, SK, AB, NU, NWT**
  - DFO.CA.FACTAP-PATPPA.CA.MPO@dfo-mpo.gc.ca
- BC, YK
  - DFO.PAC.FACTAP-PATTPA.PAC.MPO@dfo-mpo.gc.ca

Canada

Thank You!!

AAR Annual Reports -
AAR-RAA.CA@dfo-mpo.gc.ca

Comments on Potential Act -
AquacultureConsultations.XMAR@dfo-mpo.gc.ca

FACTAP -
DFO.CA.FACTAP-PATPPA.CA.MPO@dfo-mpo.gc.ca

Land-based recirculation aquaculture (RAS) design

AQUACULTURE SERVICES

LAND-BASED RECIRCULATION AQUACULTURE (RAS) DESIGN

TROUBLESHOOTING, SYSTEM IMPROVEMENT, NEW DESIGN OR CONVERSION

SERVING THE WORLD SINCE 2006!

Silk Stevens Limited is a full service design and consulting engineering firm specializing in Aquaculture Design, System Improvement and Troubleshooting. The company offers Civil, Structural, Environmental, Mechanical and Electrical design and drafting as well as material testing, safety and inspection services. Staff coupled with exceptional Associates in all the major engineering and science fields allows *Silk Stevens* to offer design services on small medium or large projects of any complexity.

Silk Stevens Limited can design and project manage your aquaculture project with a focus on excellence in engineering, client service and project satisfaction. Our staff of professional engineers, scientists, technicians and drafters can help you design and build your project on schedule and on budget. We specialize in detailed design, drafting, process improvement, automation, environmental protection, energy utilization and efficiency, regulatory compliance, facility permitting, and structural/electrical/civil design . . . for hatcheries for salmon, char, trout, tilapia, sturgeon, etc. etc. projects over a range of size and complexity. If you can imagine it we can help you create it. And make it fly!

Silk Stevens Limited is built on the belief that our clients and staff are our most valued assets. As a company, we are committed to meet and exceed our clients' needs through delivering technical excellence. We believe that teamwork, creativity and integrity centered around client needs and client input is key to project success and client satisfaction.

I hope you enjoy the following presentation.

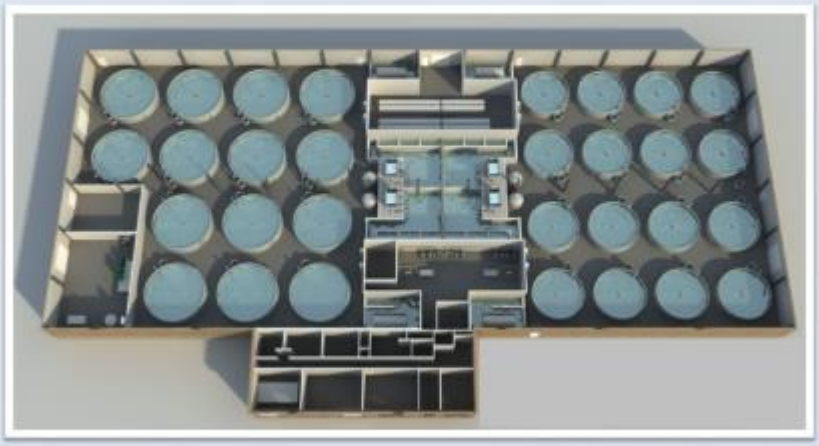
Sincerely,

D.N. Stevens, P.Eng. – Senior Engineer and President

www.silkstevens.ca

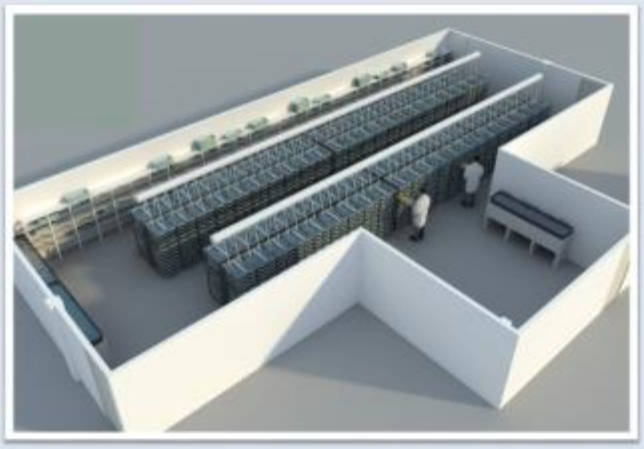
NEWFOUNDLAND SALMON HATCHERY– SITE RENDERING

NEWFOUNDLAND SALMON HATCHERY– SITE RENDERING
6,000 CUBIC METER REARING CAPACITY

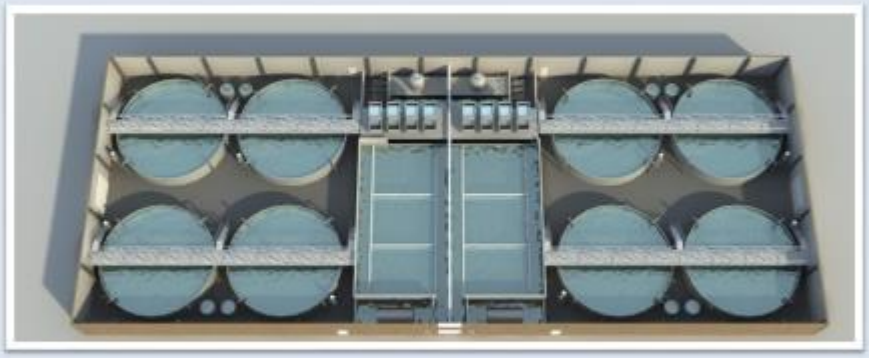


NEWFOUNDLAND SALMON FRY BUILDING– RENDERING

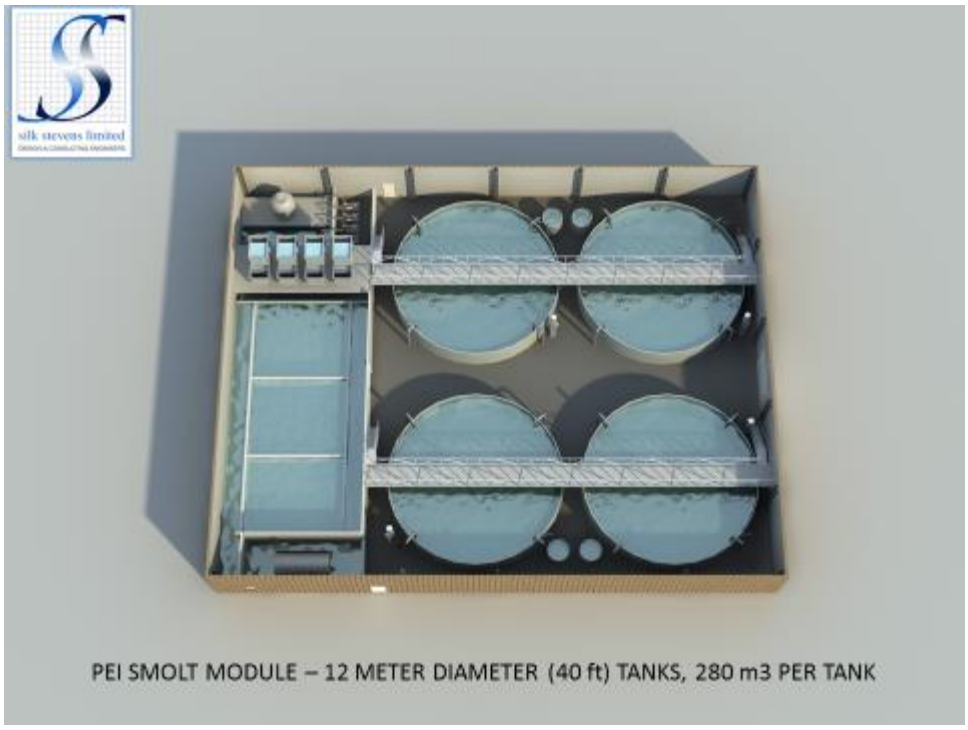
Egg Room



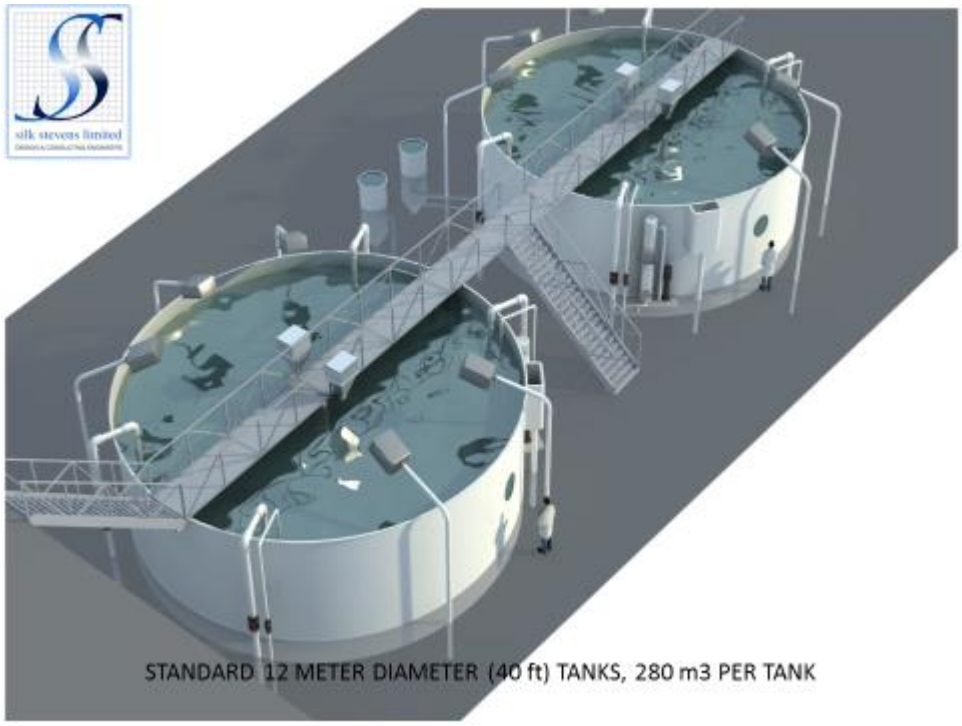
Health tray system, capacity 10 plus Million eggs



NEWFOUNDLAND FISH HATCHERY – 12 METER DIAMETER (40 ft) TANKS, 280 m3 PER TANK
900,000 SMOLT @ 150g



PEI SMOLT MODULE – 12 METER DIAMETER (40 ft) TANKS, 280 m3 PER TANK



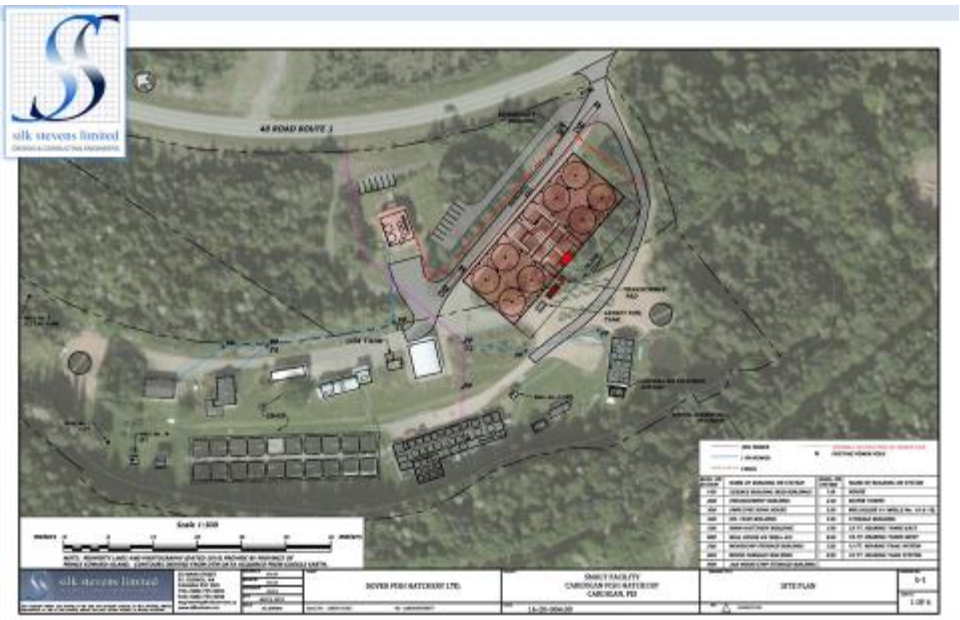
STANDARD 12 METER DIAMETER (40 ft) TANKS, 280 m3 PER TANK

Each Smolt Building (3)

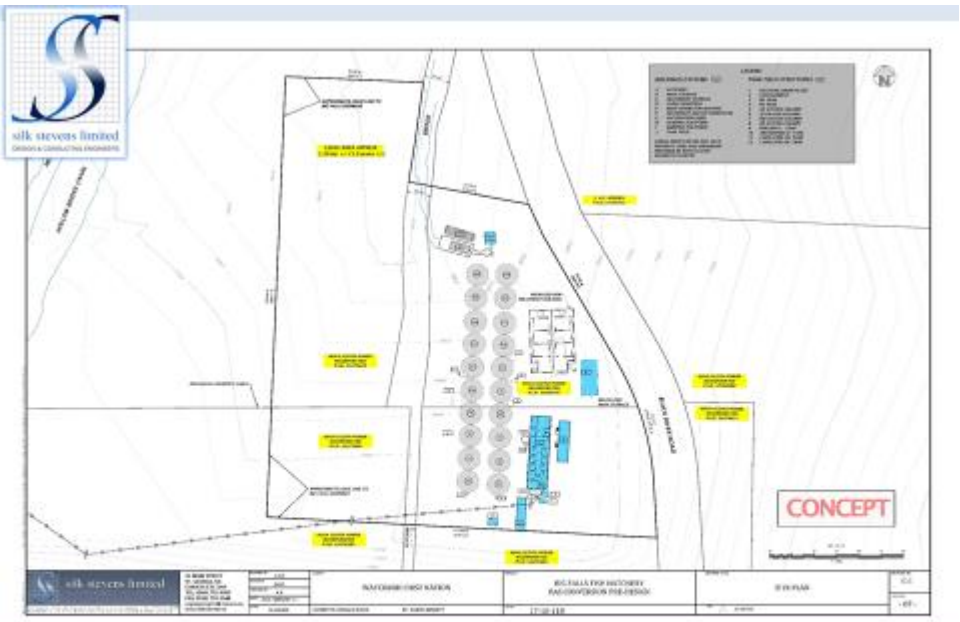
Each Smolt Building (3)

Each Smolt Building (3)

STURGEON AND SALMONID ENHANCEMENT FACILITY
OPERATE AS FLOW THROUGH OR RECIRC - 7.5m TANKS



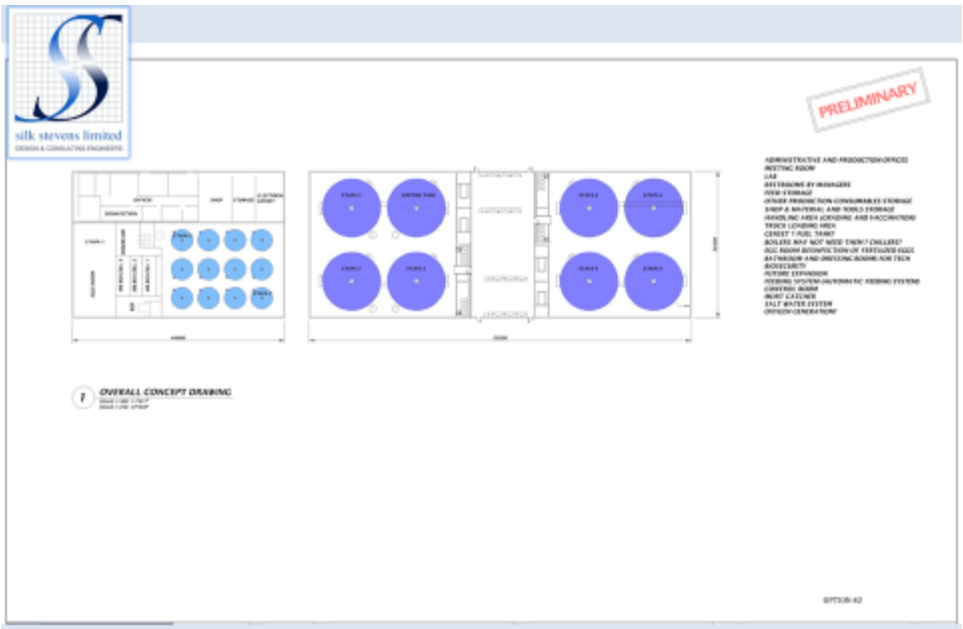
DOVER FISH HATCHERY INC. (PEI) – EXPANSION TO ADD CAPACITY FOR 1,000,000 SALMON SMOLT ANNUALLY



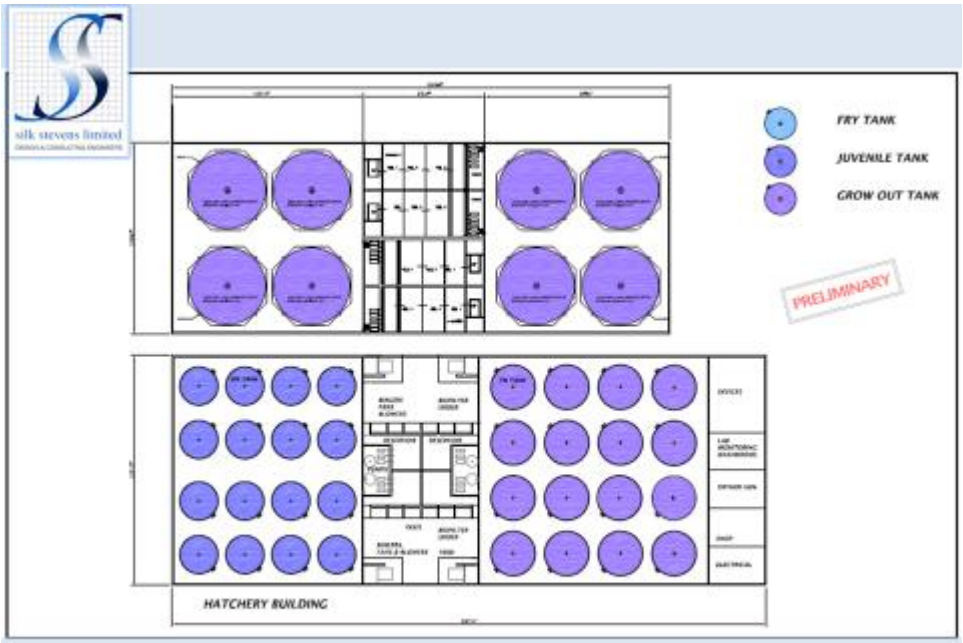
WAYCOBAH FIRST NATION (NS) – PROJECT TO CONVERT AN EXISTING FLOW THROUGH TROUT HATCHERY TO RAS (INCREASED PRODUCTION BY 110%)

AQUACULTURE RESEARCH FACILITY– 150 TONNE MODULE– LOWER LEVEL PLAN

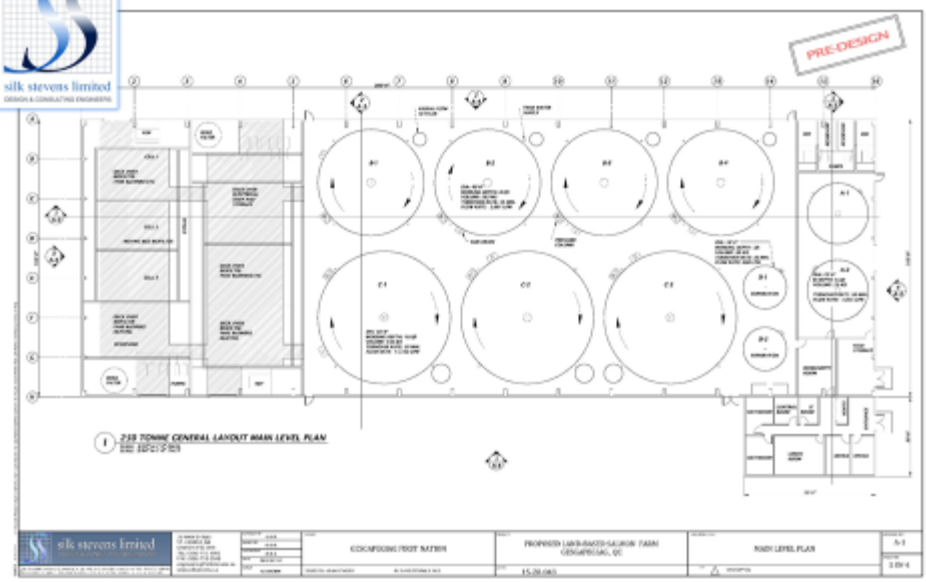
AQUACULTURE RESEARCH FACILITY– SITE PLAN AND SERVICES



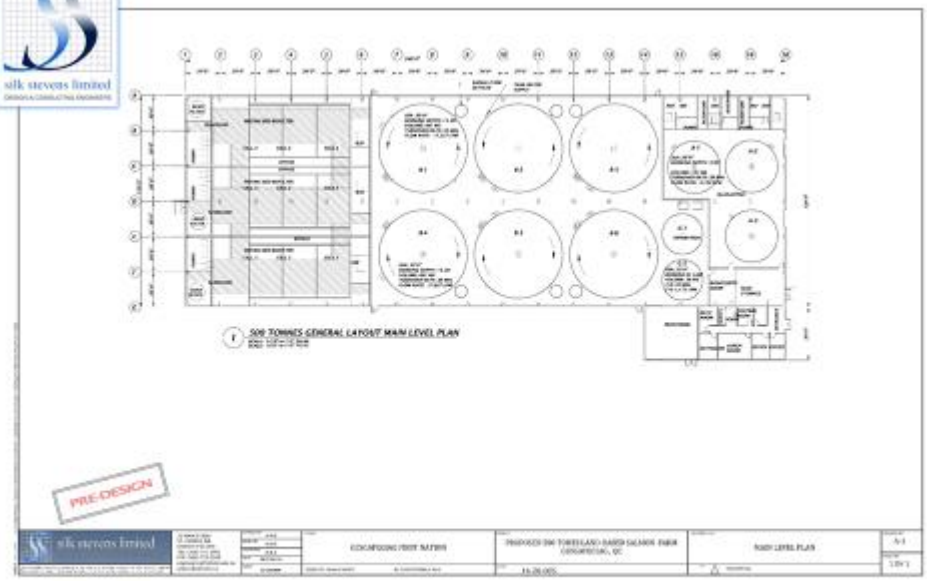
TILAPIA HATCHERY, COSTA RICA – GENERAL LAYOUT PLAN



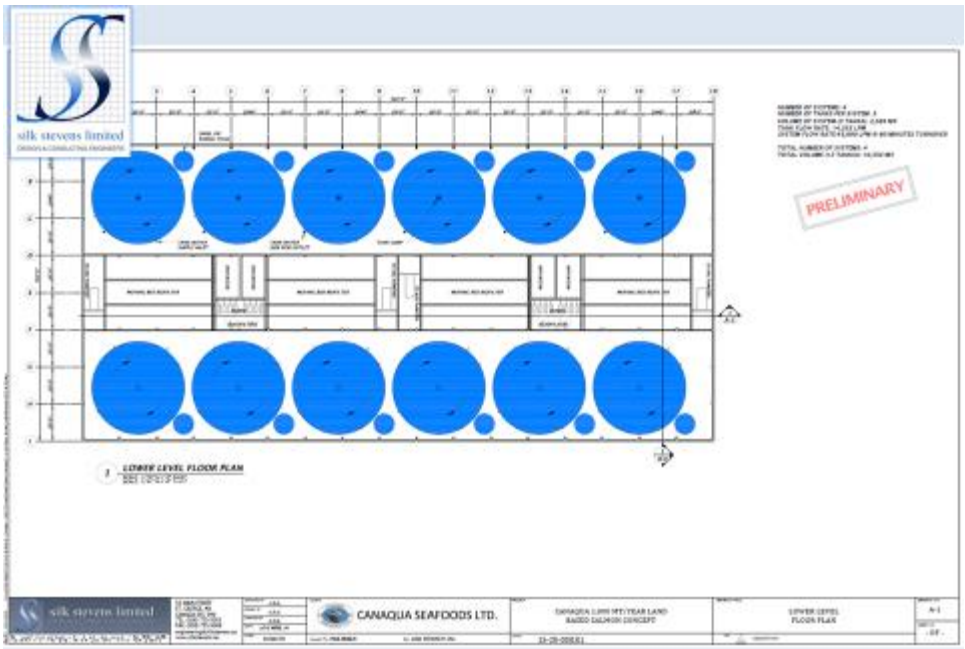
250 TPY ARTIC CHARR FACILITY – GENERAL LAYOUT PLAN



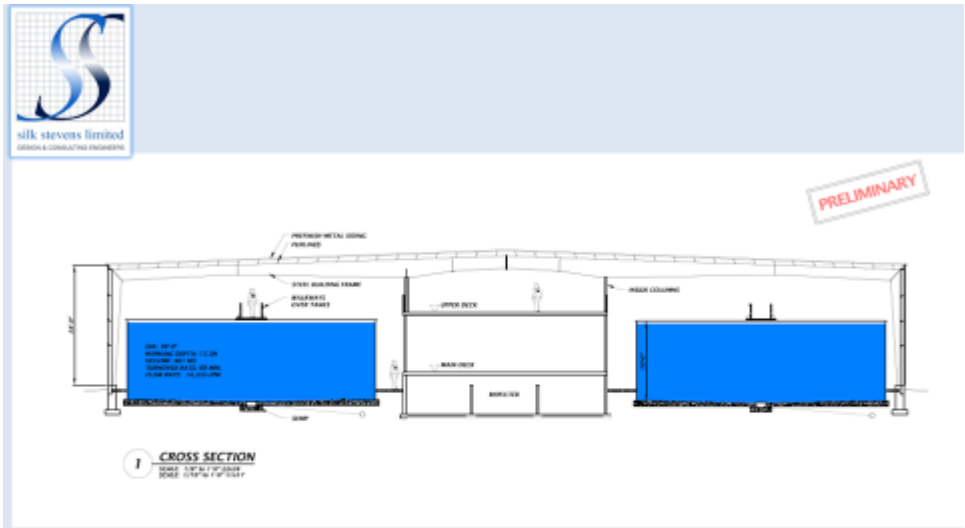
GESGAPEGIAG FIRST NATION(QUE) – 250 METRIC TON LAND BASED SALMON GROWOUT FACILITY



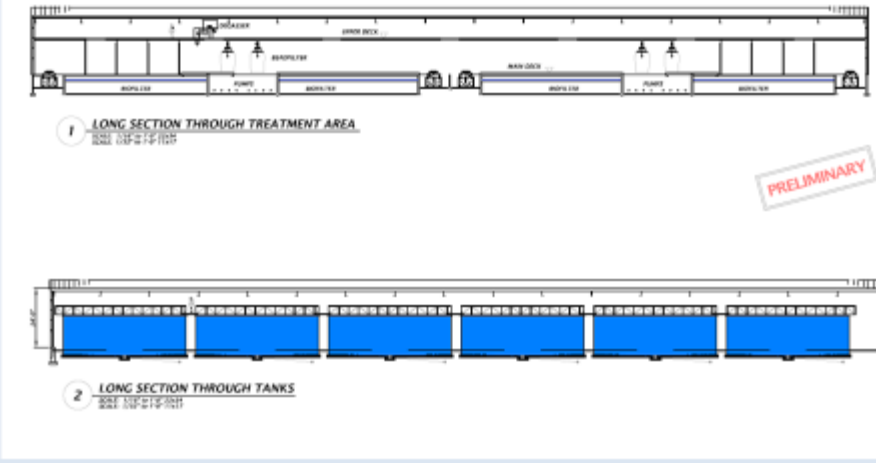
GESGAPEGIAG FIRST NATION(QUE) – 500 METRIC TON LAND BASED SALMON GROWOUT FACILITY



LAND BASED SALMON CONCEPT (NS) – 1000 METRIC TPY MODULE – LOWER LEVEL PLAN

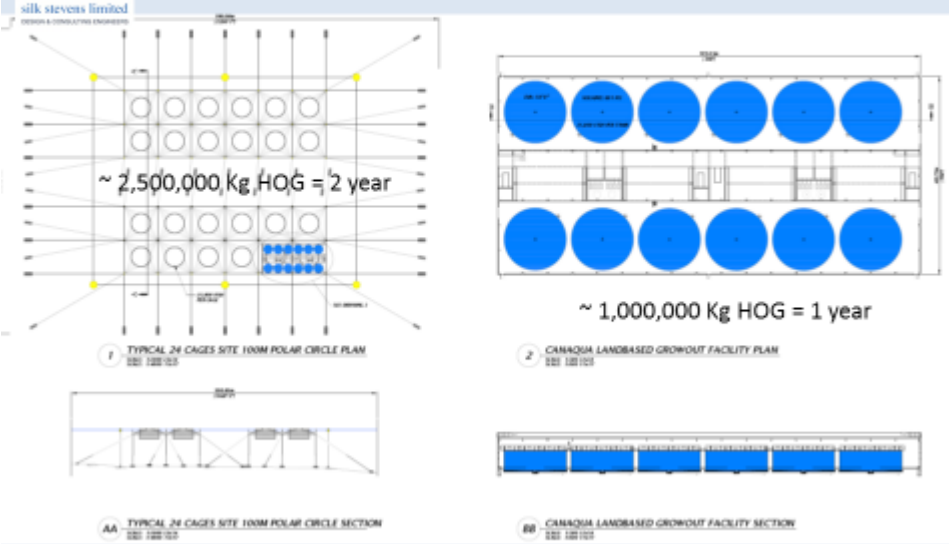


LAND BASED SALMON CONCEPT (NS) – 1000 METRIC TONNE MODULE –
TANK CROSS SECTION

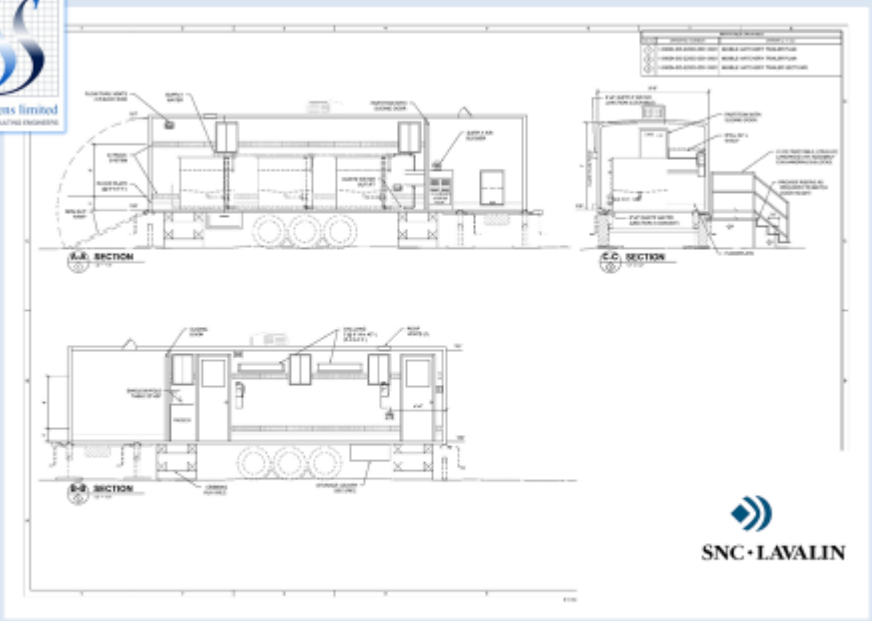


LAND BASED SALMON CONCEPT (NS) – 1000 METRIC TONNE MODULE –
TANK LONG SECTIONS

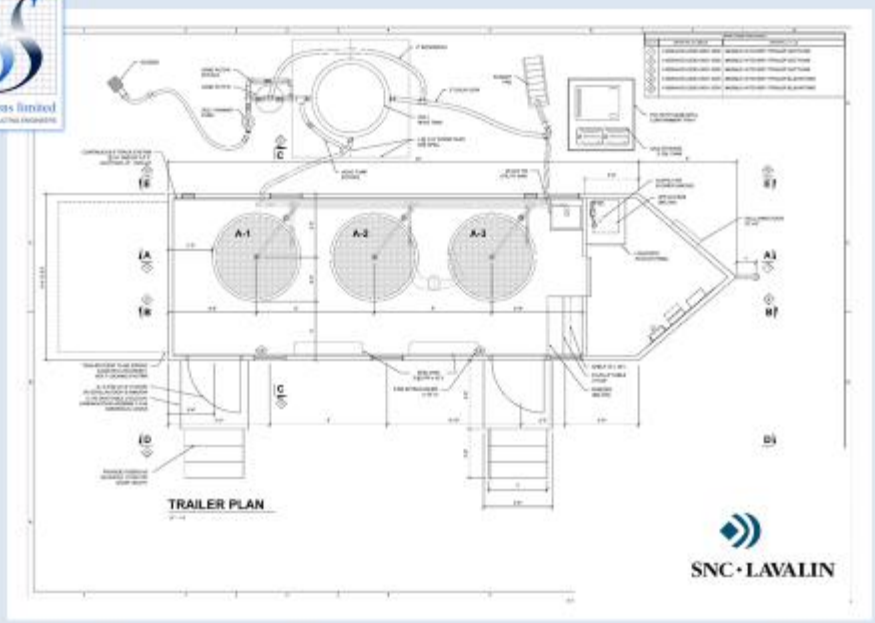
Space Comparison



WILD WEST STEELHEAD (SK) – PROJECT TO ADD A NEW TROUT FINGERLING BUILDING AT EXISTING HATCHERY OPERATION (ADDED 1.2 MILLION ANNUALLY)



SNC-LAVALIN PROJECT – STURGEON STREAMSIDE MOBILE HATCHERY



SNC-LAVALIN PROJECT – STURGEON STREAMSIDE MOBILE HATCHERY

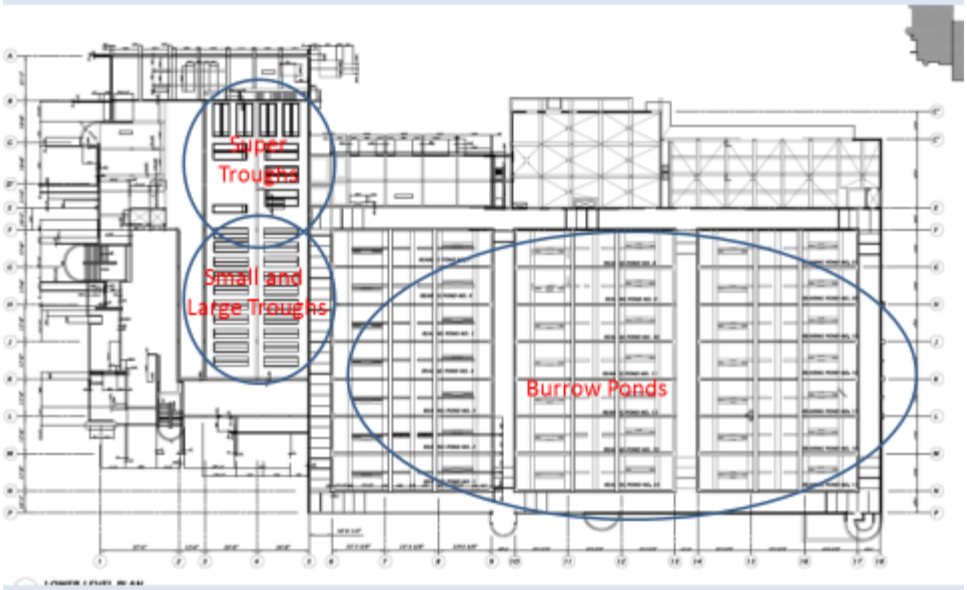
FISH HATCHERY – CONSTRUCTION PHOTOS

Provincial Stock Enhancement Facility

Sam Livingston Fish Hatchery

- The Sam Livingston Fish Hatchery (SLFH) was built in 1971 and is a partial (~70%) recirculation system.
- Grows a variety of local species for restocking
- 30 – 0.6 m^3 Small Troughs
- 10 – 0.9 m^3 Large Troughs
- 17 – 2.8 m^3 Super Troughs
- 21 – 86 m^3 Burrow Ponds
- 1,880 m^3 Rearing Capacity – Producing ~57MT

SLFH ~ 15,000LPM MAKEUP WATER (70% Reuse)



SLFH ~ 2,500LPM MAKEUP WATER (95% RAS)

What makes SSL unique - Innovation in Design

- We build solutions from the ground up (integration of the buildings and systems in the design, equipment selection, etc).
- Energy Efficiency
  - Low head pumping (the water is pumped once)
  - Using a moving bed Bioreactor designed by Silk Stevens (instead of traditional mechanical filtration).
- The design of our systems are easy built because they use parts and equipment that are readily available to find in the market.

RAS Benefit and Challenges

Benefits

- Controlled rearing environ. (temp, o2, gases, salinity)
- Increased growth rates
  - Bigger fish to sea cages
  - Bigger fish at harvest
- Increased survivability
- Organic certification
- Reduced water consumption compared to flow through

Challenges

- Cost
  - Initial Capital Investment for equipment/structures
  - Operating cost
    - Power consumption – however equipment improvements is reducing this significantly
- System Separation and Biosecurity
- Solids removal

Mariner Neptune flyers

WATERSONG Farms

Mariner Neptune
Fish Seafood Meat And a whole lot more!

Steelhead Trout

LOCAL * FRESH * SUSTAINABLE * OCEANWISE

" The fish are raised right here on the farm in an indoor recirculation system (closed loop system), which means ***there is no interaction*** between our fish and native stocks of fish. ***No concerns*** of cross-breeding or transfer of pesticides or diseases between wild and domestic stock. There *is* ***no environmental impact*** from nutrient loading to water bodies. The water in our system is biologically filtered before being released back into the environment "

Watersong Farms is located just 20 minutes north of Winnipeg in Warren, MB!

Hormones or Antibiotics?:
Hormones are not used in the fish feed. As far as antibiotics are concerned, they cannot be used because the bio-filtration system is based on using beneficial bacteria to clean the water. No chemicals can be used.

Feed?
25% fish meal with the rest being made up of grain, corn, soybeans, canola and flax (combined into pellet form)

How Long Does it Take to Grow a Fish?
From egg to 25g fingerling size is approximately 6 months. From there, 9-12 months to reach 1 kg, and 18-20 months to reach 2 kg

SeaChoice.org for healthy oceans
Recommended Best Choice

ocean wise RECOMMENDED · RECOMMANDÉ

Available NOW at Mariner Neptune Fish & Seafood Ltd. Contact your rep for details!

Order Desk: 204-589-5341
Toll Free: 1-800-668-8862

RIDGELAND
Aqua Farms

Arctic Char

Did you know?

Great baked, pan-fried, grilled or even served as sashimi, Artic char has a flavor similar to a cross between salmon and trout!

- **FRESH**
- **LOCAL**
- **SUSTAINABLE**
- **OCEANWISE**

Mariner Neptune — Fish Seafood Meat — And a whole lot more!

Pff Pacific Fresh Fish

"Ridgeland Aqua Farms is a **land-based farm** centrally located on the Canadian prairies that has achieved a Sea Choice "Recommended Best Choice" **GREEN** ranking

Our **antibiotic-free** Arctic Char have been raised in cold, clean water from a deep limestone aquifer that was once known as Lake Agassiz.

Once our customers **taste the difference**, they will always come back for more"

Ridgeland Aqua Farms **is located just 22 km east of Winnipeg in Dugald, MB!**

Mariner Neptune
Order Desk: 204-589-5341
Toll Free: 1-800-668-8862

Pacific Fresh Fish
Order Desk: 306-721-7944
Toll Free: 1-800-667-3520