

YUKON SALMON AQUACULTURE WORKSHOP

VERBATIM MEETING RECORD

March 16, 2005
Westmark Whitehorse
201 Wood Street
Whitehorse, Yukon

Present:

SEE APPENDIX "A"

1.0 Meeting Convenes

Meeting Convened 9:10 a.m.

2.0 Welcoming Comments

FACILITATOR BOB HAYES: Welcome to the Yukon Salmon Aquaculture workshop. For all the people who are not from the Yukon, we always start our meetings with an opening prayer, and that's what we will do right now. We're going to ask Joe Johnson to give us an opening prayer, and then, we're going to do introductions.

3.0 Opening Prayer

(Opening Prayer by Joe Johnson)

4.0 Introductions & Opening Statement

FACILITATOR BOB HAYES: Another thing that we do typically is we introduce everybody who is in the room so that people know who they are speaking to over the course of a couple of days, and it is really helpful for Joyce, who is doing the recording, to know who you are and why you're here, what's your representation, who you're working for or what's your interest. So, we'll go around the room from left to right on the outside, and then, back into the inside and just do a quick introduction.

CHAIR CARL SIDNEY: Good morning. My name is Carl Sidney. I'm the Chair of the Yukon Salmon Committee. I'm from Teslin, Yukon.

ARNIE NARCISSE: Good morning, pleasure to be here; my name is Arnie Narcisse. I'm the Chairman of the B.C. Aboriginal Fisheries Commission, the first time up in this neck of the woods. It's a pleasure to be

here. I'm here to give a perspective of the B.C. tribes in terms of our relationship to salmon aquaculture, the pros and the cons and the difficult issues that we've had to wrestle with over the last number of years. Thank you.

(Introductions Continue)

FACILITATOR BOB HAYES: This is an important workshop for the Salmon Committee. The issue that we're going to speak about has been on the agenda for the Salmon Committee since its inception in the mid-1990's, and there are some really important decisions that are going to have to be made over the course of the next year about the issue of transferring genetic stock of Yukon salmon to the net cage farm fishing industry, and that's the topic, and it's going to stay there. It's my job to keep it there, and the one topic that we're not going to talk about is pothole lakes. It's an aquaculture issue in the Yukon, and it's not on the agenda for today. This is the agenda. It's:

“Should the Yukon Salmon Committee support or reject the continued transfer of Yukon genetic material for use in B.C. net cage farm fishing industry?”

So, with that in mind, the background is that there is currently material that has been transferred from the Yukon to British Columbia. It's been going on for somewhere around 15 years, and the question is “Should that continue to happen?”

I'm going to talk about how we're going to do this workshop, because it's important.

(Explanation of the process)

FACILITATOR BOB HAYES: We should be focusing on getting questions and answers from the speakers. They are people that we don't know. We haven't seen them here before, and they're experts in their own field. All of the speakers who are going to be on today are people who are going to give a lot of new information about the net cage farm industry in British Columbia and some interest from Alaska, as well. One of the speakers is going to speak about the fishers' industry in Alaska and their concerns around this topic.

(Explanation of the process, con't. and review of membership of Yukon Salmon Committee and agenda)

FACILITATOR BOB HAYES: I will be giving you a brief introduction for each of the speakers, and there are bios on the speakers at the end of the handout so you will know a little bit more about the background of each speaker. There is some important information in here. Following the agenda, you will see the background of the issue, and Andrea Wilson put this together so that there is

a real simply summary about how this issue has been dealt with by the Salmon Committee. It starts in 1996, and I won't go through that. That is going to happen over the course of the day. You're going to hear how the Salmon Committee has dealt with this, and it will be on topic tomorrow.

Each speaker has got half an hour to give their presentation, and then, there are 15 minutes reserved for question and answers. The presentations will be followed by questions and answers, which are really important; because again, the opportunity for Yukoners to speak to people in this industry is today. The objective of today is to get information from the speakers who have expertise on the net cage farm fishing industry in British Columbia. After the speakers, at about 3:30, we're going to open the floor for an hour to begin the discussion part of the workshop. We will pick that up tomorrow morning and continue to do that, and all the participants, including the speakers, are invited, of course, to be part of that. So, there will be two-to-three hours of discussion with all of the group. Then tomorrow after the break will be reserved for Yukoners to speak about this issue.

The recommendations will not be made at this workshop; but all the information will be taken back, and the Salmon Committee will consider this question and make a recommendation to the Minister about this particular topic.

So, any questions about that?

(No audible response)

5.0 Introduction - Carl Sidney (Chair Yukon Salmon Committee)

FACILITATOR BOB HAYES: I am going to introduce Carl Sidney, who is going to give the first presentation. Carl is the Chair of the Yukon Salmon Committee. He is from Teslin, and he has worked on the Salmon Committee for how many years?

CHAIR CARL SIDNEY: Eight or nine I think.

5.1 Presentation - Chair Carl Sidney

CHAIR CARL SIDNEY: First of all, I would like to welcome all of you and thank you all for coming. There are a lot of people here from British Columbia and all the way to Alaska, and I would like to take the time to thank all the people for coming here. I want to thank Bob and Caroline for putting this workshop together for us. Bob has pretty much covered everything I was going to say. For people who don't know, the Yukon Salmon Committee is a main instrument that falls under the Umbrella Final Agreement, which is about 12 years old now; and the Yukon Salmon Committee is the main instrument of salmon and salmon habitat. We only make recommendations to the three

respective governments, the Yukon Territorial Government, the Federal Government and First Nations Governments; and we're here to listen to what everybody has to say about the transferring of aquatic genetic material out of the Territory. As far as I know, I think we're the only province that does this.

Last week we had a meeting in Alaska. This is an international body, the Yukon River Panel, which deals with the Yukon River and salmon and salmon habitat. I think we do have some letters. I'm not sure, but they did indicate they were going to send some letters over. I'm not sure if we did get those.

This issue has been in the Department of Fisheries and Oceans for the last 15 years. The Department of Fisheries and Oceans has been doing this practice since then until it came to the Salmon Committee probably about nine years ago. So, this is approximately ten years old with the Salmon Committee. Up until about three years ago, we simply accommodated the Department of Fisheries and Oceans because they have been practising this. Then in the last three years, it became a controversial issue between the Yukon Salmon Committee members, and we thought that we have to get an opinion from the Yukon people and First Nations Governments.

So, that brings us to this stage; and like Bob said, we're not going to make a recommendation at this workshop. We'll take all this information throughout the Yukon. Somehow or another, we're going to also have to involve the First Nations. There are 14 First Nations in the Yukon, and I don't imagine the Yukon Salmon Committee has the funding to be able to travel to each one of these communities. So, we'll have to figure out some way to make sure we consult with the First Nations. Like Bob said, we're going to be going through the presenters, and we'll get half an hour to question them and make suggestions or whatever. We'll be taking breaks throughout the day, and later on today, we'll have an open discussion about how we're going to proceed. Then tomorrow morning, we'll have another hour-and-a-half. From therein, the Yukoners will have their own discussion.

So, I would just like to welcome all of you. Like Bob said, I'll be brief, and we'll get right into it. Thank you.

6.0 Introduction - Andrew Thomson (Department of Fisheries and Oceans)

FACILITATOR BOB HAYES: Thanks, Carl. So, the first presenter that we're going to hear from is Andrew Thomson, and he works for the Pacific Biological Station in Nanaimo; and he grew up in Nanaimo. He's from the west coast, and he's done a lot of research on ocean fish ecology, and one of the things that he knows a lot about is Atlantic salmon distribution and ecology. He is going to be the first presenter, and he's going to give you a bit of background on what he's going to speak about.

6.1 How the *Fisheries Act* Addresses Salmon Aquaculture - Introduction and Transfers - Andrew Thomson (Department of Fisheries and Oceans)

ANDREW THOMSON: Good morning, everyone. First I would like to thank the Yukon Salmon Committee for inviting me up to Whitehorse. This is my first trip to the Yukon. It's quite nice weather, thank you very much. As Bob introduced me here, for the last 14 years I have worked for Fisheries and Oceans Canada on and off as a contractor, now as an employee, studying various aspects of marine biology on the west coast, mostly relating to Atlantic salmon interactions. For the last two years, however, I have served on an acting assignment as a senior aquaculture officer for the region, which means I'm in charge of aquaculture policy for Fisheries and Oceans Canada. Today I'm going to give you a very broad overview of Fisheries and Oceans' role with aquaculture on the west coast. We'll go through a background, some of the policy that drives Fisheries and Oceans Canada. Two of our main tools that we use in regulating the aquaculture industry, the CEAA and the habitat reviews, talk about Section 56, which is the transplant licensing that is on the agenda today; and I will give you a brief overview of some of the escape data, as well. So, hopefully, this will cover off some of your questions; and then, obviously at the end, I will be able to answer other questions.

So, to give you a brief overview in terms of the aquaculture industry in British Columbia, currently there are 120 tenures with B.C., of which approximately 80 are operating at any one time. Most of the fish farms are located in West Coast Vancouver Island or up in the Broughton Archipelago. There are a few farms up on the central coast and one recently approved on the North Coast area.

Again just background in terms of the landings and landed value of the aquaculture industry versus wild salmon in British Columbia alone, as you can see, wild salmon is still landing considerably more in terms of metric tonnes, thousands of metric tonnes of value; but the value is fairly close or much closer.

So, I wanted to talk mostly today about what the Federal role is, but aquaculture in British Columbia is managed jointly with the provincial government. So, I'm going to talk a little bit about the provincial role. A colleague of mine for the Provincial Ministry of Aquaculture Fisheries Food, Bill Harrower, is at the back there; and he will be able to answer more questions on the provincial role than I can. To run through some of their responsibilities, however, the province is the primary licensing authority for aquaculture in British Columbia. They are actually the ones who licence the sites. So, there is no Federal licence for the site itself. They are also the initial application window. Anyone who wants to put a fish farm in British Columbia has to go through Land, Water B.C. for a tenure, and then, the whole application package goes through them, and then, is distributed to Fisheries and Oceans Canada, Transport Canada and other Federal agencies.

They do fish health auditing and surveillance. So, they have groups that go out and ensure that the farms are complying to the Fish Health Management Plan, which is a mandatory part of their licence. They have an Inspections and Clients Branch. I believe they have eight Fisheries Inspectors in British Columbia that go and inspect each of the farm sites. Each site is visited on an annual basis to review the management plans, look at the drug use and record keeping, stock inventory, records, whether or not the nets are maintained. They have a net-strength testing metre, which they will pull the nets from the water and test them immediately and see if the net's integrity is valid. More operations in terms of how the procedure is being done on the farms. Are there best management practises for containment of, say, fuels for generators, this type of thing; and they have an arm of their branch that is also involved in seafood development that looks to aid and assist the aquaculture industry. So, that's the provincial role, and I will hopefully describe the Federal role.

So, DFO's aquaculture role, this is our vision statement from our strategic plan a few years ago, and it puts DFO as being responsible for the needs of Canadians in a global economy, policies and programs in support of Canada's economic, ecological and scientific interests in oceans and inland waters. The point of putting up the vision statement is this is where aquaculture fits in is aquaculture is seen within the department as a companion to commercial fisheries now, in that it is a user of the marine resource, much as commercial fisheries, and will be dealt with on the same level.

Following the vision statement, there was an aquaculture policy framework that was introduced in 2002 at the national level to give direction to Fisheries and Oceans Canada and allow us to move forward in developing an aquaculture program within the department. So, there are nine principles of the aquaculture policy framework, and it takes up half a book, but I've condensed them down considerably here. Essentially it puts aquaculture on an even footing with other resource users in the context of integrated and ecosystem-based management. So, again, this is, as I said, bringing it up to the same level as commercial fishing is seen. It commits DFO to follow and adapt a management approach while maintaining adherence to a precautionary principle. So, this allows us to change our procedures over time to manage the industry, and I'll show you some of the habitat management changes we have done in the last year that I think greatly improve our ability to manage the industry. Increased consultation and communications of aquaculture issues - we want to get out there and do more of these meetings so people will understand what the DFO's role is with regard to aquaculture. Work with interested First Nations to develop aquaculture opportunities - this is part of the AROM funding package, in which we can go and work with interested First Nations on the coast and help develop aquaculture capacity within the communities, whether shellfish or finfish. Today we're obviously going to focus on finfish, but shellfish aquaculture is also a big part in British Columbia. Better coordination with provincial, territorial and local governments - working on a national agreement to try to have this joint

management of this industry, whether it be in BC or Nova Scotia or wherever else, done on a more formal basis. To clarify what DFO means by “enabling” - we’re constantly being shown that we’re enabling aquaculture or we’re supporting aquaculture. I want to be very clear, in my job my goal is really to provide clear guidance to the industry; and my view is to manage the industry as we manage any other resource industry in the area. We support initiatives like the recently-approved national aquaculture animal health program, which will go and look at the aquaculture animal health of fish resources throughout British Columbia that relate not only the aquaculture industry but also the commercial fishing industry.

This is a very brief or schematic of the various interests involved with aquaculture within the region. At the top, of course, is our Regional Director General, who is currently Paul Sprout. The Oceans Habitat Enhancement Branch has two units that are involved with aquaculture. We have the major projects review unit, which conducts the CEAA reviews for aquaculture sites, and then, we also have area habitat staff. In each of the coastal areas of British Columbia, we have habitat staff that are assigned solely to look at aquaculture projects. Under science, we have an aquaculture science group, which I’ll talk about in a minute; and under fisheries and aquaculture management, we have a conservation protection branch, the fisheries officers, which enforce the Fisheries Act and have conducted investigations on the aquaculture sites and the RACO office, Regional Aquaculture Coordinator Office. That’s the office I work for. My supervisor, Allison Webb, is director of aquaculture for the region. The role of my group, the aquaculture group, is a single window for aquaculture issues. Anything with the word “aquaculture” essentially comes through our desk at some point. We work within the province, territories, industry, First Nations as a liaison and a point for information. We direct the traffic of the day-to-day paperwork in terms of aquaculture referrals and manage a program called “Program for Sustainable Aquaculture”, which is a funding program that funds the area habitat biologists and other research programs for aquaculture.

To give you a brief overview of our aquaculture science group, we have a science group based mostly at the Pacific Biological Station in Nanaimo, but we also have scientists working at the Institute of Ocean Science in Sidney, B.C. We’re looking at some of the questions around aquaculture, both on the developmental side and also on the effects side. So, in our marine ecosystems and aquaculture division, which is a new division created April 1st, we have a fish health unit that looks at the implications of health on the environment and also works on vaccines and other measures that would aid the industry; wild farm interactions, look at the distribution of live salmon, for instance, my work or other interactions with the wild; new species development is primarily in the shellfish area, looking at new species that could be raised in aquaculture facilities; genetics, we look at the genetic interaction and also the brood stocking and other tools. Our genetics lab at the Pacific Aquaculture Station is unsurpassed. It’s a very impressive lab. And nutrition, we have a scientist in the West Vancouver

lab, Dr. Dave Hage, who works on the nutrition aspect for finfish aquaculture. He's been instrumental in developing feeds that use less fish meal and more plant-based protein to reduce the need for fish meal to go into the fish feed. In Victoria, through the Ocean Science Productivity Division, we have a group working on benthic habitat effects. I'm going to talk more about some of their work later, but essentially they can model where the fish farm waste is going and help us site the farm more properly; and water quality, looking at any particulates that are coming out of the farm.

So, this is going to get a little dry and my apologies, but I wanted to give you a broad view of what Fisheries and Oceans Canada is responsible for as regulations. We essentially apply the *Fisheries Act* and the *Canadian Environmental Assessment Act* in some instances to aquaculture, and these are our major tools for managing the industry. The screenings for aquaculture activities when triggered consider a broad scope of environmental effects, such as the effects on salmon, the benthic water quality, birds; and we ensure we apply siting buffers to properly site the farms. So, the CEAA screening, which I'll talk about on the next slide, is really a key tool to help us in our siting.

The *Canadian Environmental Assessment Act* is our primary siting tool for new farm applications, a farm site that comes in. The projects that trigger this environmental assessment, they are triggered by a law-list trigger. It has to be an action of the Federal Government triggers this assessment procedure. The triggers most common for aquaculture sites are *Navigable Waters Protection Act* permit. Anything you put in navigable waters requires an NWPA permit. By issuing that permit it triggers the CEAA process; or a Fisheries Act authorization, which is an authorization to create a HADD under Section 35 of the *Fisheries Act*. Either of these actions by the Government will trigger a *Canadian Environmental Assessment Act* screening. The *Navigable Waters Protection Act* was formerly managed by Coastguard under Fisheries and Oceans control. It has now been shifted to Transport Canada, so there is another Federal agency that will do some of the screenings for aquaculture sites.

The lead department, whether it be Fisheries and Oceans Canada or Transport Canada, conducts the environmental assessment; however, other Federal departments, such as Environment Canada, or in the case of Transport Canada being the lead, Fisheries and Oceans Canada, would provide advice for that screening.

The purpose of the environmental assessment is whether or not a project, whether it be a bridge or an aquaculture facility or whatever it is that we're doing, is likely to cause significant adverse environmental effects when you take into consideration any mitigation measures that go into place; and I'll show you an example of what I mean on the next slide. The results of the environmental assessment gives you an idea of whether or not the project will give significant

environmental effects or not. If it's not likely to, then the project can proceed and the permit, whether an authorization or a Nav Waters permit, is issued.

This is a little confusing, so hopefully in the graphical form it will make more sense. This is how we look at a fish farm site if it comes in through Land, Water British Columbia. It comes in through the PRT, which is the top box there, which is the project review team. It's actually a joint federal/provincial team that looks to make sure the application is complete, has all the information we're going to need to review it. It comes in under the *Navigable Waters Protection Act*. There is almost inevitably a Navigable Waters trigger. Anything you put in the water will require Navigable Waters. We then look at it under Fisheries and Oceans to see whether or not it is also a *Fisheries Act* HADD (Harmful Alteration, Disturbance or Destruction of Habitat) trigger. If it is an authorization trigger, then Fisheries and Oceans Canada becomes the lead agency for the environmental assessment. We or Transport Canada conduct the environmental assessment. We either conclude that it has significant adverse effects or not likely, in which case, the *Navigable Waters Protection Act* permit or the authorization is issued; or if we conclude that environmental effects are likely, in which case, it gets sent back to the proponent to either relocate or redesign or withdraw the application.

The heart of this *Canadian Environmental Assessment Act* is the valued ecosystem component table. This is a table in the back that identifies each ecosystem component and what effect the project may have on it and what mitigation measures are in place to reduce that effect and what's the ultimate effect after the mitigation measures are introduced. Not every VEC is treated the same. Some VECs will have more critical habitat implications and are given a higher weighting than others. I'll show you an example of the VEC table. This is an example of a VEC table. If you have an activity, such as net cleaning or the use of antifoulants on a net, then we look at what the potential project, the environmental reaction is, it's release of toxic or biological waste into the environment from the net cleaning, or the use of antifoulants could impact fish or fish habitat through water quality change. So, the VECs are what are the ecosystem components that could be looked at through marine water quality or fish habitat, benthic habitat or fish resources, we'll lose actually the ecosystem components we're worried about, and then, we'll judge it as low. We have a matrix that actually allows us to score, based on geographic extent, temporal extent, how long will the effect last, what is the nature of the effect. Then, that allows us to give a one-to-fifteen score and come out with a low, medium or high assessment.

Included in a CEAA, which is a very key component, is cumulative effects assessment. What this does is allow for not every project to be viewed as its own island, if you will, but also to look at the other projects that may be occurring in the area so that we can see if there's an effect from other projects that may be occurring. So, we have to look at other projects, and it doesn't have to be just of the same ilk, it doesn't have to be just fish farms; we look at all industrial projects

that may be occurring in the area. So, it's a consideration of the cumulative environmental effects that are likely to result from the project, in combination with the other projects or activities that can or will be carried out. So, we look to see if there are too many sites, say, in an area that would have an impact on the cumulative effects. So, that explains the CEAA process. That's one of the processes that we use.

The other process, under Section 35 of the *Fisheries Act*, which we manage as Fisheries and Oceans Canada, is a habitat review. What impact will any of the projects have on fish and fish habitat? Whether we do it under CEAA or not, this is a review that goes on for any of the projects. So, to give you an idea of what the habitat reviews are, if we see a project coming in, there essentially are three directions any project could go that we have determined. Through the last year, we have come up with a very standardized approach, a very almost mathematical calculation to determining a HADD that I will lead you through. This has been a big change for Fisheries and Oceans Canada, in that it gives much more clarity to how we apply our regulations so everybody can understand where our regulations come from. It is not based on a subjective view of one biologist or another. It's based on the application of a model, models where fish farm waste could go and how much may be deposited. We have three outcomes of our habitat review now for fish farm sites. We have the first scenario if it's below the authorization threshold, a letter of advice is sent to the proponent saying, "You've sited the farm in an area that won't cause deposition to the level that we are looking at and no federal monitoring requirements are required. However, the B.C. monitoring requirements from the Ministry of Land, Water and Air Protection are still in effect." Scenario two, which is where most of the farm sites of British Columbia will fall, are above the authorization threshold, and a Section 35 authorization is required and habitat compensation is required; and I'll talk about those mechanisms later. Essentially this is the mechanism used for virtually every industrial project that goes on in fish habitat in British Columbia or anywhere in Canada, in that we authorize an impact to occur, and we ask for compensation to compensate for the impacted habitat. Then scenario three, above the authorization threshold with critical habitat concerns or habitat cannot be compensated for. If it is in an area that we view the habitat as too critical, we just won't allow it to continue, and the proponent must relocate or redesign or withdraw the application.

So, the big change for us was, as I mentioned, the establishment of this authorization threshold. It's based on a review of the scientific literature, the B.C. Waste Regulations and standards in other parts of Canada. The threshold is 5 grams of carbon per m³ per day coming out of the DEPOMOD depositional model, and I'll talk about DEPOMOD in a second. That threshold of 5 grams of carbon may be amended over time. If we view it as not being protective enough, we can amend and adapt our approach over time. Compliance with this threshold will be harmonized with the B.C. Waste Regulations. Part of our enabling approach to aquaculture is we want to ensure that our regulations are in

line with other territories and provinces' regulations so that a company or an individual doesn't have to comply with four sets of standards but rather one harmonized set of standards.

This is a slide showing you the DEPOMOD depositional model and how we treat it. So, essentially what it does is take a fish farm location, and it can model where the fish waste and the excess fish feed may end up. The inputs we look at is where the cage is obviously, what the currents are underneath the farm, how deep the farm is situated; and it gives us a picture of where that fish waste should go. I'll show you on the next slide. So, if you look at this slide, the yellow boxes are the cage sites for a farm site. So, if you can imagine, obviously a fish farm is not a single cage. It is a collection of cages usually around a central walkway. So, the yellow boxes form that cage site. The blue lines are the bottom bathymetry showing the depth contours, 25 down to 100 meters; and the brown lines are where the fish waste will end up through this depositional model. So, it takes into account the currents and everything. The line we're interested in is the "5" line. That's the level of authorization that we determine, 5 grams of carbon per m³ per day, and that is the area that we would authorize and require compensation for; so looking at where the impact is greatest and what can be measured.

Once the site is authorized, we want to ensure that that authorization is accurate. Essentially, it's coming out of a computer model. There is no guarantee that the model predicts everything that can occur in the natural environment. So, there is a compliance measurement that goes on, including sulphide measurements from the provincial individuals. We're requesting an ROV or a remote-operated vehicle transect underneath the farm to look at what might be occurring. We're in negotiations with Water, Land and Air Protection to have an LOU to ensure that that data is transferred back and forth properly. That's what we're trying to do is to make sure that the footprint we predicted is the actual footprint that is going to occur. Why we're so caught up on this footprint is we want to be able to ensure that we're siting a farm so that it has no waste impact on areas of critical habitat, areas like yield grass or areas like an anemone bed. We want to make sure that any of the farm waste is moving away into areas of lesser habitat, the sort of deep water, sandy-bottom areas that we view as being a lower rate habitat that may be impacted.

So, that was my review of our siting tools, which is the CEEA, *Canadian Environmental Assessment Act*, and also the *Habitat Referrals Act*. So, we use those two tools for every new fish farm application that comes in to look at where the fish farm would be best sited.

To give you an idea of some of the other issues that Fisheries and Oceans deals with in regard to aquaculture, certainly one of the issues we want to talk about today is transplant licensing. Fisheries and Oceans Canada has a section of the *Fisheries Act*, Section 56, that we allow the movement of fish and fish products

within the province from one rearing facility to another, licensed under Section 56. The reviews are conducted by a joint federal/provincial introductions and transplants committee. However, the licenses are issued by the Federal Government, as per D.O.J. advice, that we are the licensing authority. The reviews take into account what ecological, genetic or disease implications a transplant may have and what mitigation measures can be put in place and applied for before that transplant is approved. These transplants are guided by a national code on introductions and transfers, which is a code that was introduced three years ago to guide how these introductions can occur and what assessments need to be done. The I.T.C. permitting process I mentioned doesn't just look at internal transplants but also looks at external transplants coming into the country, as well. All of them are conducted not only under the National Fish Health Protection Regulations, but there's quite a stringent group of regulations that require fish health testing on the transfer thing; but also, under the Atlantic salmon import policy, as well. When we do transplants even of non-Atlantic salmon within British Columbia, we look at a very stringent policy of looking at gametes or fish must go from a quarantined facility to another quarantined facility. They're inspected or disinfected en route. Those quarantined facilities are inspected by Fisheries and Oceans Canada to ensure that they are disease-free before any licenses are issued. The introduction and transplant committee, as I mentioned, considers the ecological disease and genetic impacts before issuing these licenses.

So, to switch gears once again, I want to talk a little bit about a program that I have run for 12 years under funding from the B.C. Ministry of Aquaculture Fisheries and Food, the Atlantic Salmon Watch Program. This is a program to monitor the distribution and abundance of Atlantic salmon throughout British Columbia. I only have two slides here to show you. The first is: B.C. Escapes of Atlantic salmon just to give you an indication of the amount of fish that escape each year in British Columbia. Escape reporting is a condition of licence to the Provincial Government and can be actioned against if it's not done, so most of the escapes in British Columbia are reported. The big escape year, as you can see, is 1998 there were a few large losses of fish. If you look over the length of time that we've run the program since 1991, we average about 40,000 fish per year escaping in British Columbia. We have seen a marked decline from 1998 down to 2003. In 2003, only 36 fish were reported escaping in British Columbia. In 2004, through two unfortunate incidents, the numbers jumped back up to 39,000 fish approximately. The majority of those, 33,000, were juvenile fish smaller than smolt. Likely you won't see much of them again. You can see again the red dots show where the fish farms are.

Just to give you an idea of some of the work the Atlantic Salmon Watch does is I monitor the marine catch of Atlantic salmon, and this has given me a very interesting perspective. We see two big peak years, three if you count 1997, peak years of catch of Atlantic salmon in British Columbia. These are years that all followed what I call "mop-up fisheries" essentially. What we tend to find with

monitoring Atlantic salmon over this 15-year period is that the population of Atlantic salmon in the marine waters of British Columbia is directly proportional to whether or not there is an escape right before a net fishery. If you have a large escape of fish and a net fishery follows, you'll find fish. If you don't have that, it's very difficult to find fish. So, in 1993, we had two large escapes of fish up in Johnsons Strait right before a sockeye opening. In 1993, the sockeye opening was a very large number of gillnets in the area. They caught a large proportion of fish in a very short period of time, 4500 fish in a weekend essentially. In 2000 again we had two very large escapes. We had 4500 fish, followed by a 36,000 fish escape. Within three or four weeks, again there was a very large number of gillnets in the area. They caught a significant number of fish.

In the years when you don't have those big escapes, followed by a net fishery, the catch rates for Atlantic salmon are quite low. They're very small compared to the number of Pacific salmon being caught.

An internet site that has more of this information and more general information on Atlantic salmon, on aquaculture in general, on our policies and regulations and also on some sea lice data as well: www.pac.dfo-mpo-gc.ca. If you have any questions, I would be happy to answer them.

My colleague, Bill Harrower, would probably like to explain a little bit better about the provincial role.

6.2 How the Fisheries Act Addresses Salmon Aquaculture - Introduction and Transfers - Bill Harrower (BC Ministry of Agriculture, Food and Fisheries)

BILL HARROWER: Thanks very much. Andy, could you flash up that slide you had on the provincial role for a second, please.

I just want to say a few words here very briefly, I realize it's a very tight schedule, but I did want to talk a little bit more about what is actually happening with the provincial role with managing and developing aquaculture in B.C. So, I'm going to pirate from Andy's slide here for just a minute. One of the things that is important to know is, as Andy stated earlier, we are the ones who actually licence the activity of aquaculture in British Columbia; and the applications go through Land and Water B.C. Our staff then review those applications, look at them from the viewpoint of whether or not they look like they're going to be sustainable proposals. So, we evaluate them from the viewpoint of biology, looking at siting, making sure that they meet certain key siting criteria; and also, taking a look at things like what is there now. For example, I've got staff who go out to proposed salmon farm sites. They take accurate depth soundings. They look at the nature of the bottom. They actually use an ROV to look at the habitat and see what's there; and using that and a number of models and current information, they can then determine whether or not the site that's proposed looks like it's going to be a

sound and sustainable operation, and this is really crucial. That's one of our activities. We actually look at sites before they go in and assess whether or not they make sense from both a biological and an economic viewpoint from the viewpoint of are they sites that look like they're going to be good sites.

Now, one of the other things we do, as well, is -- that explains what happens with new sites. If a site plans on changing, though, for example, if it's going to expand, then we want to know, first of all, whether our assessment of the former activity was correct; and secondly, what does the new production level represent. Consequently, we go back, and we look at those sites again. So, we look at them and evaluate them to see whether our initial determination was correct and whether they can support an increase in production or not. Once that is done, we prepare a recommendation to the licensing officer who is actually the one responsible for issuing the aquaculture licence. So, that's part of our role.

Now, as well as Andy mentioned, we have a number of fisheries inspectors, and they go to all of the salmon farms in British Columbia at least once per year, more if a file is opened up where there is need for further investigation; and they're responsible for ensuring that the farms comply with all of the terms and conditions of the aquaculture licence under the Aquaculture Regulations, and there are a lot of conditions they actually have to comply with. So, they're checking on that, and as Andy said, one of the things they do is they check the inventory records to see whether there are any unreported escapes. They check drug use, and they check net strength. They check and ensure that the farm was correctly installed. So, all of those things are done to ensure that farms are run in a sustainable fashion.

Now, I'm going to digress for just a minute here, and I'm going to keep my comments short; but one of the things that we also do as part of industry development is we look at issues that are either perceived constraints to the aquaculture industry or public concerns that should be addressed as part of aquaculture. So, we've worked on a number of different questions and issues over time. One of the issues that I have had the pleasure of working on actually a number of years ago was looking at Chinook brood stock development in British Columbia; and one of the things we realized at that time was the entire industry was based on two Chinook stocks, and we had no idea then whether those were the best stocks or not. That was what was available to British Columbia at the time, and a decision was made then to evaluate a number of different stocks and see if they had some sort of desirable attributes that would make them more suitable to aquaculture in British Columbia. Over about a four-year period, we actually evaluated some 22 or 24 stocks of Chinook, ranging from South Coast stocks right up to -- we didn't actually cover the Stakine, we covered the Kitsum-Calum, some of the Skeena River stocks, Maurice River, that area, and some of the Northern Fraser stocks, as well. So, we looked at all these different stocks, and what we found out was there are, as you would

expect as fishermen, real differences in the fish and also how they perform in aquaculture.

Now, that program unfortunately kind of wound down when the industry went through a real downturn in 1991; and after that, a big part of the industry changed over to Atlantic salmon for reasons that we won't get into right now; but the interesting thing there was that we did find that there were real differences that made some stocks of Chinook more desirable for aquaculture than others. So, I just wanted to put that on the table right now.

Other than that, I just wanted to make myself available for the next day-and-a-half, I'll be leaving tomorrow afternoon, so that if there are any questions, both about the provincial role and about some of the issues that we've worked on, I'm available to talk to people, and I will leave business cards, and you can reach me by e-mail.

I want to thank the organizers for giving me these minutes to speak and thank you all for being here.

6.3 Comments & Questions - How the *Fisheries Act* Addresses Salmon Aquaculture - Introduction and Transfers

SPENCER EVANS: My name is Spencer Evans from Creative Salmon, and my question is for Andy. Obviously Atlantic salmon have escaped from the aquaculture industry in B.C. Are there any rivers that actually sustain returning populations of Atlantics?

ANDREW THOMSON: Not sustain to the best of our knowledge; we have found, with ourselves and with our provincial colleagues, river systems, in which Atlantic salmon have spawned and juveniles have been produced, but we've found no evidence that those juveniles have exited the river, completed a lifecycle in the ocean and come back to start establishing a population. It was certainly significant when the juveniles were found, but it doesn't indicate that a population has been established, no.

LORELEI SMITH: I was wondering, you gave us information in regards to Atlantic salmon. How many Pacific salmon are escaping each year?

ANDREW THOMSON: We do get those records brought in. It's been a very small number in the last few years. One of the major reasons, of course, is 80 percent of the production in aquaculture is Atlantic salmon. So, a very small number of farms actually raise Chinook salmon. I cannot recall the last major escape of Chinook Salmon, other than say about 2,000 pieces in 2003 escape; but I can get that data and certainly provide it for the committee within a day or two.

LORELEI SMITH: And the other question I have is for those escapees, do you guys have any tracking program to see if they're spawning with --

ANDREW THOMSON: If Chinook salmon are spawning? Well, you know, interestingly enough, it is a much more difficult prospect to identify escaping Chinook salmon than it is to identify Atlantic salmon. I was very fortunate in my research to be able to have a very easy-to-identify fish. However, we did foresee this difficulty, and we conducted a research program with the PBS, Pacific Biological Station Genetics Lab, in which we wanted to see if we could genetically determine farm Chinook salmon from hatchery Chinook salmon or wild Chinook salmon; and through a very small test run, funded in part by the Aquaculture Collaborative Research Development Program, it was determined that we had that ability, we had that tool, if you will, in our toolkit to genetically tell an escaped Chinook salmon from a hatchery or a wild one. So, if we had a river system which we were concerned, for instance, that there was a large influx of escaped Chinook salmon; but again, like I say, there haven't been large escapes of Chinook salmon, we could potentially tell what percentage of those fish had escaped. We don't have an active monitoring program for looking for Chinook salmon escapes, no.

JAY RITCHLIN: Thanks, Andy and Bill, most of my questions were just asked and answered. My question is: The concern has been raised from many quarters that the Atlantic salmon watches is not necessarily as robust as it might need to be, and there are estimates from industry in other parts of the world that show -- not estimates but recorded evidence that show much higher levels of escape than we report here in B.C., even in Norway where they have a very recently and very stringently updated net cage construction regulation. There are the concerns around leakage, which may be up at a half percent a year. Can you say with any confidence that we have a very accurate assessment of the escapes here in B.C., and then, in particular how you envision we would go about determining any effective genetic drift caused by Pacific escapes.

ANDREW THOMSON: I'll do my best to answer those questions. In terms of the escape numbers, I would certainly grant you that, say, 10-to-12 years ago, the escape monitoring was not as stringently applied by either industry or the governments as it is today. Most of the time, the escape reports that I get now in the last three years are escapes of one fish or zero fish. A lot of times a company will phone in zero fish escaped to warn me that there was an incident, a net dropped but there was another containment net to hold those fish in. So, we have seen an increase actually in the number of reports but a decrease in the numbers, and I think that speaks to a lot of it, in that we have much stronger cage structures now. We have much better siting in places. You have much better training for the farm staff, as well.

Now, a check on that is obviously whether or not we're seeing a pulse in the catch rates that would indicate that we're not getting the reports in. If I saw an enormous amount of fish being caught but a very small number of fish being reported escaped, I would know there was an obvious problem there. We're not seeing that. We're seeing a very direct correlation of the number of fish that are reported escaped to the number of fish being caught and always on a less-so basis. The biggest escape that ever occurred on the west coast of North America was in July of 1997, 327,000 Atlantic salmon escaped from a fish farm in one day in Rich Passage, which is near Seattle, from the farm breaking up. Well, that year in Washington State only 2500 Atlantic salmon were caught in all the commercial fisheries, tribal fisheries and take-home fisheries and through extensive fish counting fences on the river systems. So, what that shows me is the vast majority of fish that actually escape from a fish farm are actually never seen again. So, you don't see this huge amount of Atlantic salmon out there.

On your questions of genetic drift, I think it's all a matter of proportion. I'm not a geneticist, and you're going to get me out of my league in about two seconds here; but the key is to keep the fish in the net pen and to realize that the numbers of fish that may escape are a very small proportion of the number of fish in the wild.

BILL HARROWER: If I can just add a little bit to that, one issue that's interesting is that with respect to Chinook, we have had some Chinook that have been escapees, very small numbers, that have actually been caught again in recreational or commercial fisheries; but certainly there have not been any significant numbers of Chinook that would be obviously marked by the kind of changes in fin morphology and things like that that would indicate that there are significant numbers of them out there from that viewpoint either. So, so far, certainly from the West Coast of Vancouver Island I haven't heard of numbers of them where they are being farmed, and that's really almost the only place they're being farmed now, that would likely represent some sort of a threat to the genetic integrity of the local populations.

ARNIE NARCISSE: Thank you, Arnie Narcisse, Chair of B.C. Aboriginal Fisheries Commission. You guys have just left yourselves so wide open, but I'll just stick to one issue here. Especially in terms of this slide that you've got here, all wonderful objectives; yet we as First Nations in British Columbia have had a hard time in terms of being part of these monitoring efforts. So, I want to talk about the transparency of monitoring efforts. On one of the slides, you talked about DFO, B.C. and industry working together in terms of ensuring these sort of efforts go on. Yet when First Nations request this sort of data, yet when First Nations request the ability to join in these sort of monitoring efforts, industry is very reluctant, very reluctant to allow this to happen. Indeed, one of our chiefs, a fellow named Charlie Williams, has been barred from some parts of his own territory because of his opposition to fish farming and his desire

to engage in the monitoring of the fish farm activities in his territory. So, in terms of the transparency of the monitoring efforts, I would just say that there needs to be much more. Thank you.

BILL HARROWER: Thank you, Arnie, that's noted, and it is a valid concern. I'm not going to belittle Arnie's concern at all. I am going to say, by way of information, first of all, that as a matter of fact, we are trying to organize a meeting with Chief Charlie Williams this weekend to go over exactly some of those concerns. So, hopefully that will be resolved.

The other thing I want to say there is that in some cases, both government and industry have been more successful in involving First Nations in monitoring. For example, there are agreements between the Ahousaht and companies that operate in their area that have ensured transparency between the company and the Ahousaht. The same is true of the Kitasoo, and I believe the same kind of an agreement is being negotiated with the Kitkatla. So, there is certainly effort there to increase the transparency between First Nations and companies operating in their areas.

GERALD COUTURE: Gerry Couture, Yukon River Panel; my problem relates back to utilizing Pacific salmon in the industry. It is good to hear there have been no major escapes; but given the application of Murphy's Law, sometime in the future this could happen. My question is: Pacific salmon from the Yukon could interbreed, for instance, with Clayoquot Sound Pacifics or that sort of thing. If that occurs, what can be done about it? In other words, what contingency planning is in place to deal with a major escape, given that it could occur? With Atlantics, it's not much of a problem. They don't interbreed, but Pacifics do. How do you plan on handling that?

BILL HARROWER: I'll take a kick at this one, thank you for the question. It is a very good question. One of the things that is in place as part of the regulations covering aquaculture is that there have to be escape recovery plans in place, and some of those include having local vessels on contract that can seine fish just after an escape event happens. So, that is part of the licensing conditions.

The other question, though, and this is a valid one is: What happens if those fish get out? One of the things that the literature suggests at least is not only escapes, whether they happen here or in Norway with Atlantic salmon, very few escaped fish seem to find their way back to freshwater. Now, part of that may be because they don't recognize the scent of the water; part of it may be simply the fact that these fish, because they've been kind of in a cultured situation their entire life, they don't recognize the physiological cues that say they have to find freshwater; but one of the things we do know is a big percentage of those fish just seem to drop off the map. They don't find freshwater again. So, if there was one escape event that happened and contributed to spawning; and the other

piece of information there that seems to be coming out right now is that escaped fish do not spawn with the same success as do their wild progenitors. In other words, a lot of escaped fish, even if they do get onto the spawning grounds, are not successful in spawning. There is some literature that supports that, although it is not conclusive at this point; but as a result, if there is a single event in B.C., it's not as likely that that will pose a significant threat because of the fact that lots of our Chinook come back as three's, some as four's, some as five's. So, the genetic impact of that is not that likely. Where it would be a problem is if you had large escapes over three or four years at one location that went back to a river where the fish stocks were depressed; and hopefully, Murphy's Law isn't going to be strong enough to allow that to happen. So far we certainly have not seen that.

FACILITATOR BOB HAYES: I'm going to call a break. Joe Johnson is going to follow up this afternoon. He is going to have a question to Bill and Andy. We'll take a 15-minute break.

Meeting Adjourned at 10:20 a.m.

Meeting Resumed at 10:35 a.m.

7.0 Introduction - Spencer Evans (Creative Salmon)

FACILITATOR BOB HAYES: The next speaker is Spencer Evans, and he works with Creative Salmon. He is the General Manager of Creative Salmon in Tofino. Spencer has worked for almost 20 years in that industry in Tofino. He has also worked in South America, he's worked in Europe on aquaculture issues; and of course, in British Columbia. He has also brought with him Moses Martin, who is not going to present but is going to be available for answering questions. I will let Spencer introduce Moses shortly here.

7.1 Benefits and Support of an Aquaculture Business - Spencer Evans (Creative Salmon)

SPENCER EVANS: Good morning, everybody. Obviously, I don't need to introduce myself. I am going to give the presentation for Creative Salmon today. At the end of the presentation, we have Moses Martin available to field questions with me, and as well Tim Rundle. Tim, if you could just stand up for a second. Tim is our senior fisheries biologist and operations manager. He's a graduate of Guelph University and has been with Creative Salmon for over 12 years. So, biologically-related questions to Tim.

My presentation today is going to cover a brief history of Creative Salmon, and I will highlight some of our key operating philosophies, which include sustainable development, respect for our employees and our community, respect for the environment and fish health and addressing the issues that face our industry on an ongoing basis.

Of course, I will also talk about Creative Salmon in the Yukon. I will chronicle our last 15-year history here, talking about the activities as they were and as they are today, and then, what we view as the mutual benefits for the Yukon, as well as for Creative Salmon.

So, about the company, Creative Salmon was established in 1990. We are a Canadian-owned and operated company. We are not a multinational with feed plants and fish farms scattered all over the globe. We're actually a very small company; and in fact, one of the smallest salmon farming companies in the world. We produce about 1500 metric tonnes of Chinook salmon every year, and all of that Chinook salmon comes from genetic material from B.C. We do not produce any Chinook salmon from the Yukon. The Yukon program at the moment is merely just a brood stock program.

We focus on quality salmon, not quantity; and to that end, we are pursuing organic certification for our fish. Creative Salmon was a founding member of the Pacific Organic Seafood Association (POSA), and together with POSA, we developed organic standards for the culture of salmon in the Pacific Northwest; and these standards are as good as any that exist anywhere in the world. They include things like no antibiotic use and no growth hormones. We deal only with indigenous species. We have a great concern for the welfare of the animal; and in essence, it all boils down to sustainable farming.

Where are we located? We're on the west coast of Vancouver Island. Our head office is in the town of Tofino, and you really can't go much farther west in Canada unless you've got a really good boat! The farm sites are located just east of downtown Tofino, and you can see this is Tofino here where the head office is, and our six farm locations are all scattered around Tofino Inlet in the southeastern corner of Clayoquot Sound. This area is the traditional territory of the Tla-o-qui-aht First Nations community. All of our farm sites are located within their territory.

All of Clayoquot Sound was designated a UNESCO biosphere reserve in May, 2000; and part of the reason Clayoquot Sound was designated a biosphere reserve was because companies like Creative Salmon that operate in that area were deemed sustainable. So, what is a UNESCO biosphere reserve? In essence, it's a global laboratory for sustainable development, and I think Creative Salmon is an excellent example of what sustainable aquaculture is all about. What does sustainable development mean for Creative Salmon? Quite simply it means that we can generate economic benefit while having respect for our employees, respect for our communities, respect for the environment and for the fish that we grow. That's what it means to us, and this is what we try and do each and every day that we operate.

Employees are a key part of our operation. We spend a lot of time and energy in training and educating them. They are deeply committed to Creative Salmon, and they are just as committed to us as the company is to them. They're a great team, and they do a great job. We are very involved in our local community. As I mentioned, the sites are in the Tla-o-qui-aht First Nations area, and we were the first aquaculture company in British Columbia to employ a First Nations person as a liaison between the company and the First Nations community. We're also very involved in the local community in a whole bunch of different ways. These include activities: sporting, basketball, baseball activities, even providing nutritious food to the school hot lunch program. Our involvement in the community has gained us considerable respect, and we're very, very involved in our local community.

Respecting the environment, in order to respect the environment, you have to be able to measure the impacts that you have on the environment; and I don't care what you do, whether you're in fishing or forestry or tourism or aquaculture, everybody has impacts on the environment. What Creative Salmon has done is developed a very sophisticated environmental monitoring program to measure our impacts. We did this in the early '90's, and we did it with the help of an environmental engineering company, and we designed and implemented our own program to measure our impacts. This was done before there were regulations from government to do so, and it was the first of its type.

So, what did we learn from our environmental monitoring? We definitely learned that we have an impact. We found that uneaten feed and fish faeces could accumulate on the seafloor, and it could alter the habitat of the floor; but we also found that it could be managed with things like fallowing. I'm going to talk more about fallowing in a minute, but it's basically just rotating of sites. That's a key part of reducing your environmental footprint.

Another key component to reducing your environmental footprint is through what we call "feed management". It's the buzzword of the industry, and it really talks about how to feed your salmon; and you have to remember, unlike land animals, it's very, very hard to see what the salmon are doing when they're underwater. How did Creative Salmon solve that problem? We've turned to the use of underwater cameras. We were one of the first companies to start using these cameras in '96; and today we have cameras in every single cage, permanently installed in every single cage. Every meal is monitored and adjusted to the appetite of the fish. Our technicians are so skilled at feeding fish these days that, just by watching the schooling behaviour of the fish, they know when the fish have reached satiation. This ensures that fish are fed properly and feed waste is kept to an absolute minimum. Feed represents about 40-to-50 percent of our operating budget, and we cannot, from an economic standpoint, waste feed, just as we cannot from an environmental standpoint.

This is a little clip of what it looks like to our technicians as the fish feed on a regular basis. It's as though they're laying on the bottom of the ocean or the floor of the cage, looking up at the fish as they feed. The camera is suspended in the cage and is on a pulley system so that it can go up and down in the water column or back and forth across the cage to capture where the fish are actually feeding.

Fish health is also a key component to our success; and not only do we have healthy fish, we have healthy staff. Part of a good fish health program is starting with quality smolts. At Creative Salmon we have a team of three full-time biologists, and one of their responsibilities is to oversee a very sophisticated brood stock program. All of the parent fish that we work with are screened for diseases that are naturally occurring in our area, and only the cleanest-quality genetic material is used to propagate the next generation of fish. Once these quality smolts are brought to the ocean, we adhere to a very strict fish husbandry protocol; and this includes things like feeding high quality feed, no mammalian substitutes like feathermeal or bloodmeal. We just use the finest quality feed substances in the formulation of our feed.

Minimal handling of the fish, this is a key component to having healthy fish. We basically put the fish in the cages to start with. They stay there for their whole grow-out cycle. We don't handle them until it's time to harvest.

Low-density rearing, that's another big key to our success. We put fewer fish in each cage than anybody in the industry; and as a result, we have the lowest densities in the industry.

Health monitoring, this is another key component to our operation. Part of the biology team's responsibility is to follow our divers who dive the cages twice per week, and our biologists inspect any fish that the divers retrieve. This is also done by a licensed veterinarian, who visits the site once a month; and in this way, we are able to stay on top of any health problems that may be arising.

So, how do you measure the success of your fish health program? Well, in our industry, the yardsticks really are your dependence on antibiotics and your survival rates. Creative Salmon has a fantastic track record. We have not used antibiotics on production fish since October 17th, 2001. This is a record we are incredibly proud of; and on top of this, we obtain survival rates from 90-to-95 percent from smolt to harvest. Those survival rates are the envy of the industry, and we do it without antibiotics.

Addressing the issues - obviously aquaculture is a contentious topic, and that's part of why we are here today; and Creative Salmon has always faced up to the issues and addressed them as best we could. What are the issues from the Yukon perspective? Well, we spent quite a bit of time reviewing Jodi Cox' literature review; and from her work, we kind of pulled out the four most important issues that face the Yukon from our perspective. These included the price of wild

salmon, also disease and sea lice, escaped fish and, of course, fish farm wastes; and I'm going to talk briefly about each one of these.

The price of wild salmon, I guess that's probably the only thing all of us in this room will agree on is that the increased production of global salmon aquaculture has reduced the price of salmon around the globe. That's probably the only thing we'll all agree on for sure. Having said that, I think it's important to remember that Canada's contribution to the global production of salmon is actually quite small. It's miniscule. We're a distant fourth in global production of salmon; and as a result, we're price-takers. We're not price-setters. We do not do anything about price. We do not control price. I know there are people in British Columbia and in other parts of Canada that would like to see the aquaculture industry in B.C. come to an end; and if they are successful in doing what they want to do, it won't make any difference to the price of world salmon, and that's an important thing to remember. Low prices affect all of us. They affect Creative Salmon, and they affect the commercial fisherman. So, what do you do about it? What does Creative Salmon do about it? Well, the flipside of all this extra fish out there is that it's created markets where markets never existed before. We've got new markets for higher and better-value quality salmon than we've ever had before, and Creative Salmon has a product that is so good that we are able to target niche markets and get high prices for what we do. Yukon Chinook, wild Yukon Chinook, are world-reknown for their quality, high fat content and brilliant flesh colour; and there is no reason in the world that these fish cannot be in the same niche markets and getting the same prices. I can guarantee you that there are buyers in the world who would be willing to pay a premium price for a yearround supply of farmed and wild Chinook salmon. They would pay a premium to have it on a yearround basis.

Disease and sea lice, I've lumped these two together just for convenience. Of course, disease pathogens exist in the marine environment, and of course, they are a concern for Creative Salmon; but I demonstrated earlier that with the use of good-quality smolts and strict fish health protocols, we can have extremely high survival rates without the use of antibiotics. From Creative Salmon's perspective, disease is not an issue, and it's the same with sea lice. Of course, salmon have lice. That's a natural fact. They occur in the wild, they occur on the farms, but the lice levels at Creative Salmon are so low that we have never had to treat for lice ever; and we know that the levels are low, because we constantly monitor the fish on the farm and count the lice. We know that the levels are low in the rivers around the farms, as well. In conjunction with the First Nations community, we monitor the rivers and check the wild fish for lice, and the lice levels are low. This whole sea lice issue, in my opinion, has been sensationalized by special interest groups and the media.

Escapes, escapes are a concern for all of us; and of course, we don't want to have escapes. What does Creative Salmon do about it? We have a system of routine maintenance and daily inspections. This means we're looking at the nets

on a daily basis. We're checking anchor lines to make sure that everything is in good shape. Bird nets, predator nets, everything, we just constantly review and make sure that everything is in good shape. We use high quality nets. Net manufacturing has changed a lot over the years, and today nets are stronger than they've ever been before. They're also resistant to U.V. rays; and as Bill Harrower mentioned earlier, there is a stringent net monitoring program that we have to adhere to, and we test the breaking strength of the nets on a routine basis. We physically run them with a hydraulic press and test the breaking strength. If it falls below the Government minimum level, it's discarded. Containment nets when handling fish - I told you we didn't handle the fish very much, and it's true we don't; but things like smelt deliveries and harvest, you need to handle the fish, and we use containment nets around everything we do to help reduce our losses.

Predators - seals and sea lions have been known to rip holes in nets, and they're around in the marine environment all the time. At Creative Salmon, we have a nonlethal predator control system in place. We don't have guns on site. We don't shoot any wildlife, and we don't use any kind of acoustic devices to scare wildlife away. What works for Creative Salmon is nets that are well-anchored, keeping the sidewall of the net rigid and the low densities. The seals and sea lions come by the farms on a regular basis and often just swim on by.

Storms - storms are another concern and can certainly affect escapes. All of our sites are anchored according to engineered specifications. We're well prepared for any storm that may come our way. So, what is our success rate? We're not perfect. We've had less than 15 escape in the last five years. We're going to do better in the next five years.

Fish farm waste - I talked about fallowing earlier as one of the ways to manage waste; and Creative Salmon is an active farm fallower if you like. We fallow all the time. We have a short-term program of three-to-four months for every single farm site that we operate. I said earlier that we put the fish in the farm and keep them on the farm until they're harvested out. Once the fish are harvested out, the farm sits empty for a minimum three-to-four months before it's stocked again. That's the short-term fallowing program. It happens to every single farm that we use, every single farm that we put fish into. On top of that, we have a long-term program where we can fallow farms two-to-four years. We do this, because we have six tenures within the Tla-o-qui-aht First Nations' territory. We only operate four at any one time. Between the long-term fallowing and the short-term fallowing, the ocean floor can return to its natural state before the farm was there; and we know that because we do our own environmental monitoring to prove it.

Creative Salmon is actively involved with the scientific community on an ongoing basis to address the issues that face the industry. Right in front of you is a list of a number of researchers and scientists that we are currently involved in and the institutions that they represent, and these people have offered to write letters of

support, attesting to Creative Salmon's involvement with the scientific community to address the issues; and I would like to leave copies of these letters with the Yukon Salmon Committee. I hope you'll take the time to read some of them. They're excellent letters, and they speak volumes about our commitment to the environment and to research and development. I also will leave copies of these letters with the Department of Fisheries and Oceans.

So, that brings us to the Yukon, beautiful place that it is. When did we come to the Yukon, and why did we come to the Yukon? Those are two very good questions, and I hope we can clarify that today. We started in 1990. That's the first time we came to the Yukon. Why did we come here? Because your fish are well known for their rich colour, high fat content and just general quality all the way around. Creative Salmon recognized an opportunity to domesticate a very prized stock. We came here to collect genetic material to start our own brood stock program. Here is a timeline that kind of summarizes our activities: In the first six years, we collected eggs and milt from the mainstream river near Minto. We did it under the licence of a commercial fisherman. The eggs were fertilized and incubated at the Whitehorse Hatchery, and 1996 was actually the last time we took eggs. In fact, 1996 was the last time any wild genetic material was used. Since then, we've relied on our own brood stock program. Since 1996, all the milt that we have collected has been frozen and held in inventory. From '97-to-1999, we collected only milt at Minto from the mainstream river. In '98, the river returns were so poor that out of respect for the resource, we didn't collect any milt at all. From 2000 to date or 2004, we've been collecting milt from the hatchery, and we're collecting milt from spent males. In 2001, we didn't collect milt from the hatchery either just because of the poor returns.

So, what are we doing now? What do we do today? We continue to collect milt from the hatchery. The milt is collected after the hatchery staff are finished with the male. We do a complete disease screening of all males that we collect milt from.

And what are the mutual benefits as we see it? Well, in the early years, our activities provided economic benefit to the hatchery. They also provided local benefit for our time spent here. We don't spend as much time in the Yukon now at the hatchery, but we do come every year and stay in your hotels and eat in your restaurants and so forth. What we also do is we add value to your resource. We take milt from males that would otherwise be discarded. So, we're adding value to something that would be discarded. We provide very valuable disease information about the stocks in the Yukon River. This information is obtained through the screening process that we go through with each and every fish. The information is provided to the hatchery and it is provided to DFO, but probably the biggest benefit of all is the genetic banking of your material. We provide a living insurance policy with an inventory of live and frozen Yukon genetics. This material will be made available to the Yukon should the need arise.

Why do we want to continue? We want to continue to strengthen and expand the relationship we've developed with the Yukon. We want to do that because we believe that there are joint ventures out there that would be of mutual benefit to both of us, and one never knows what the future may hold. Those are the main reasons why we want to continue working in the Yukon.

So, your question, the question of the day that you guys have to consider is: "Should the Yukon Salmon Committee support or reject the transfer of Yukon salmon genetic material for use in the salmon net cage farming industry," that's a tough question to say, and that's the question that you guys, over the next couple of days, have to ponder; and while you're thinking about it, we ask you to consider our history in the Yukon. We ask that you consider Creative Salmon's approach to sustainable aquaculture, and we ask that Creative Salmon be allowed to continue doing what it's doing with the support of the committee and the public that it represents. In fact, we would like to rephrase the question and have it read: "Should the Yukon Salmon Committee support or reject the transfer of Yukon genetic material for use by Creative Salmon?" That's the question we would like you to consider. Thank you very much.

7.2 Comments & Questions - Benefits and Support of an Aquaculture Business

SPENCER EVANS: For questions, Tim and Moses, you've got to come up here with me.

LORELEI SMITH: I have a couple of questions. One is on the genetic banking. I know that's one of the big selling points Creative Salmon has always done. I was just wondering myself, from the DNA work we've done on the Yukon River Panel and stuff, the genetics that you have, I don't see it as a benefit, because it's mixed stock genetics. It's not from actual streams. So, I was just wondering how it would be a benefit.

TIM RUNDLE: To answer that one, a little bit of history there, when we started, we wanted to go from specific streams to make that milt even more valuable; but since it's main stem for the most part -- the rest of it is from the Whitehorse Hatchery, so we actually know where those fish not exactly are going but at least a source. So, I would think that milt is made more valuable than the main stem. I guess I picture a possibility, and hopefully this never happens; but what about an entire crash of that Yukon run? Would that genetics not be of value, at least a starting point, to try to help the resource?

LORELEI SMITH: Well, I have to say I hope I'm not around if we ever do that; because I know with the Panel on the Yukon River, it's management first of wild salmon stocks, not enhancement.

The other question I had or I guess it's a comment, just as far as making it "Can Creative Salmon do it", the Yukon Salmon Committee is not here to say that you guys are doing a bad job as far as Creative Salmon, the company; and we have to look at the bigger picture. You guys are not necessarily the only ones that will come to the Yukon for our genetic material. So, we have to look at it as worldwide, not just Creative Salmon. Thanks.

CHAIR CARL SIDNEY: Thank you, Spencer. My question is: When you talk about quality feed, what exactly are you talking about? What is high quality feed, and where do you get it from? Thank you.

SPENCER EVANS: Our feed, we don't use any substitutes in the formulation of our feed. A lot of the industry is using, like I said, mammalian meal products in the feed, feathermeal, bloodmeal, that sort of thing that we do not use. In the formulation of feed, there is a requirement to use a vegetable matter in order to combine the feed so it can be extruded into a pellet form. We use an organically-certified wheat for that purpose. The fish meal that we obtain, when it's available, it comes from the wild herring roe fishery out of British Columbia. Unfortunately, that's not available on a yearround basis. So, when we can't get that, we take it from fisheries from South America that are deemed sustainable under the United Nations Food and Aquaculture Organization. So, that's what I'm referring to by "quality feed items". Also, we don't use any vegetable oils in the feed, because we can't be guaranteed of being genetically-modified-free; and it's one of the requirements of our organic certification, no GMOs.

GERALD COUTURE: A question in the same vein, Spencer: Can you give me an idea of how much of the feed is made up of fish meal from the various fisheries and how much you are moving towards feed from other materials that perhaps are more environmentally sustainable, I mean plant materials and that sort of thing? What's the proportion?

SPENCER EVANS: Well, globally I can tell you that global production of fish meal, about 40 percent of the global production of fish meal goes into world aquaculture. The rest of it goes into agriculture, feeding land animals and often providing fertilizers. Of the 40 percent of global fish meal that goes into aquaculture, about 17 percent of that goes into salmon farming or salmon diets. What is Creative Salmon doing? Does that answer your questions, Gerry?

GERALD COUTURE: In part; what are the proportions of your feed that are not fish meal?

TIM RUNDLE: Sorry, I don't have the numbers right in front of me. It's actually on our website, as well; but I believe the wheat portion

ends up being somewhere around 30 percent. Fish meal is the biggest number of that, fish oil, as well.

And to answer your question a little bit about alternatives, we are involved in a proposed project to look at some alternate oils, vegetable oils, but they have to be certified organic to try to cut down on our fish oil usage. The fish meal we use, again like Spencer mentioned, is all from sustainable fisheries that have been operating for umpteen years as sustainable fisheries. We are looking at alternatives, but for the organic approach, we need to have certified organic products.

The other option there, too, is you've got to remember that fish eat fish. So, if you start changing that diet too drastically, you're going to lose the health benefits of the fish and also, you could affect taste, as well.

GRAHAM VanTIGHEM: I think it was last year or the year before there was an article in *Science*, which is a pretty high profile journal, about farmed salmon and the safety of farmed salmon for human consumption; and it wasn't actually a very positive article, and I've always kind of wondered, from a fish farmer's point of view, why it was written the way it was and just your general comments on that, given that it is a pretty high profile article.

SPENCER EVANS: Well, there was a real specific reason why the paper was released when it was released and got the media coverage that it did; and it was an attempt to provide misinformation to the public for sure.

We do test for PCBs in our salmon and our feed, and our levels are very, very low, just like they are with wild salmon, well below the standards set by the Food Inspection Agency of Canada and the FDA. They're at very, very low levels. Unfortunately PCBs occur in just about everything that we eat; and in fact, in fish they're lower than they are in dairy products and lower than they are in meat. So, it's an unfortunate reality that we all live with, but our levels are very low, and they are safe. Salmon is safe to eat.

STYD KLUGIE: I had a question on the genetics. You mentioned that you came to the Yukon in '96, and you got the genetics from the Minto area, which is the Yukon River, right?

SPENCER EVANS: Yes.

STYD KLUGIE: We're in a traditional territory of a First Nations. I'm just wondering what consideration or consultation your company or DFO or whatever the process was, what consideration and consultation there was for the allowance, you know, just the process of taking these genetics and using them down in another traditional territory in B.C. and what are their views in

B.C. in their traditional territory, using our genetics in their area? I don't know if there was any fair process in using these genetics.

SPENCER EVANS: That process started in 1990, and I honestly cannot say. I don't know what consultation took place at that time. I don't know, Bill, if you were here back then. I don't know if you want to comment on that or not.

Reluctantly he's coming to the microphone.

BILL VERNON: I'm the former general manager of Creative Salmon and now retired sort of. When we first came here, we came here hoping to be able to access the material from discreet rivers for what's already been stated, the obvious reason. We wanted to be able to identify traits that would be useable in aquaculture. DFO chose the route of having us participate in the mainstream commercial fishing, and it was because, in my opinion, it was an easier route to go, less controversial.

In terms of consultation, at the time, there wasn't the same level of consultation that there is now; but every year that we have come up here from the start, we have always made an effort to consult with the people involved in the Yukon River. I made, as a practice, at least three trips a year to the Yukon. One was during the summer, and the other two often were geared around the time of the Quest, but also to be able to speak to people about what we were doing and hear the concerns and try to react as a company. So, I can't tell you about all the meetings that occurred, but I've been to Dawson and participated in meetings there. I've participated in meetings here every year. So, there has been an effort to consult, with both DFO and the local people.

MOSES MARTIN: [Greeting in First Nation language] I just want to, first of all, say "Hello" to the local First Nations for allowing me in your territory to speak. I come from the traditional territory of which Creative Salmon operates, and the question that was asked about consultation between First Nations and Creative Salmon is also something that's fairly new with us; but over the years, we have developed a relationship that respects one another in our territory. I very much believe in those words that "We're all here to stay." So, how is it that we work together? One of them that is very important to this is communication.

ARNIE NARCISSE: Thank you for the presentation. I must admit that I was quite impressed by the fact that you folks seem to be cognizant and respectful of the First Nation's issues and concerns. I'm really glad to hear that from you, Moses.

The issue of the low stocking density and the non-use of antibiotics, I would imagine there is a definite correlation between the two; because what we're

finding down in B.C. is that they aren't as mindful of the environment as you folks appear to be here. The stocking densities are very, very thick, nowhere near what I viewed here.

Your practice of fallowing I would say is a very good one. It was, indeed, one of the recommendations that we tried to make in 1997, Bill, at the Salmon Aquaculture Review, this practice of fallowing, to leave specific parts of the territory alone so that it might be allowed to rebuild itself. We were engaged in a contaminants study, I believe, in your area in proximity to some of the operations there, and I'll be speaking about that later in my report; but what I will report is that the impacts of wastes upon the traditional foodstuffs is less in your area than it is in the Broughton. There is a high density of fish farms in the Broughton Archipelago, as you're well aware, and what we're finding is that there is a definite correlation between the impacts upon the traditional foodstuffs of our people. It's being more heavily impacted in the Broughton than it is in your area. So, you folks seem to be doing some good things.

I will comment upon the community benefits. I saw just about a whole slideful of them, and I want to commend you on that; because the other guys, the big, international players, have no desire to do such activities like that, to fund local community efforts, and I would say that you folks are going a long ways towards doing that.

So, I guess my question, not for you guys, but more for the regulatory agencies and their representatives here: Why doesn't B.C. and DFO insist upon equally stringent regulations for all operations, such as you are doing here? I just wanted to make that comment. Thank you.

8.0 Introduction - Jay Ritchlin (David Suzuki Foundation)

FACILITATOR BOB HAYES: Right now we'll get Jay Ritchlin ready to come up.

Meeting Adjourned Briefly and Resumed

FACILITATOR BOB HAYES: I will introduce Jay Ritchhlin, who works for the David Suzuki Foundation. He's been working in the field as an environmental scientist, advocate and an educator for about 12 years. He's worked on a whole bunch of different things related to the environment, including pulp and paper, as well as this issue on net cage farm fishing. I'm going to let him tell you a little bit more about what he's going to say.

8.1 Environmental and Socio-economic Impacts of Salmon Net Cage Farming - Jay Ritchlin (David Suzuki Foundation)

JAY RITCHLIN: Thanks very much, and thanks to the Yukon Salmon Committee for inviting us to be here today. I enjoy the opportunity, and it's great to have my first visit to Whitehorse. Also, in addition to the environmental work that I've done, I have spent some time in the Alaskan commercial fishery. I worked primarily in the processing plants, plant manager, and a little bit with some of the setnetter/gillnetters in the rivermouths in the Kenai Peninsula, Cook Inlet and up to Bethel. So, I've got a strong love of salmon and of the marine environment, and a really very strong issue of concern for myself, as well as for the David Suzuki Foundation, to see a sustainable use of this resource.

The David Suzuki Foundation is a group that does more than just marine issues. As many of you may know or may not, we're a registered Canadian charity. We work in the areas listed there. I work for the Marine Conservation Program, and all of us now are working on this issue of "sustainability within a generation". I'll talk about it a little bit more in a moment, but these areas we try to interact and overlap with each other as much as possible; and in particular, the forest and lands with the riparian areas and planning issues around salmon streams and the climate change team with our concerns around the effects of climate change on salmon populations are areas of overlap between our various programs.

The Marine Conservation Program focuses on these areas primarily: sustainable fisheries and marine habitat issues and aquaculture; and all in all, those fall under an umbrella of something that we would like to see in place in all of Canada, which is an ecosystem-based management model towards fisheries management and fisheries use. And for us, that would include a strong commitment to the precautionary principle, broad stakeholder consultation, managing for broad habitat and ecosystem effects, not just on a species-by-species catch basis, and a variety of things like that. I know those aren't the issues we're here to address today. Our website has information on our positions and papers we've produced on that if you're interested.

The concept of "sustainability within a generation" is one that we produced in the last several years and are working very hard with right now at the Federal level, and that is the vision to see by 2030 Canada be a leader in world sustainability, and that is in all aspects of our efforts to make a living for ourselves and develop our country. Currently, Canadians I believe all would like to be there. Unfortunately, by the ratings used on an international basis, we're not doing terribly well right now. Much of this, granted, is due to the fact that we're a major energy exporter; but there are a number of other things that have been cited in reviews at the international level around the way we, science, manage industry, transparency, things like that, that all need improvement to bring us up that ladder.

Now, in the context of salmon farming, the sustainability issues are many from our point of view. I would like to acknowledge that Creative Salmon does try very

hard to do much better at some of these things. Having said that, though, I do need to just take some issue with the characterization of environmental issues as hype or overblown. Much as Creative Salmon has many talented scientists who support their work and believe in what they do, many of us in the environmental community are also dedicated to sound science and making very careful policy statements, regardless of the fact that science in the natural world will very rarely ever give you a smoking gun. So, I could line up a list of PhDs to support the work that we do, as well, and we could have that battle all day. It's certainly not the place to do it here, but I do not accept the fact that all these issues that we've talked about are pure hype.

The last two issues that are in bold here I think are the ones that I will spend most of my time talking about today, because they are clearly the ones that are most relevant to the issue in the Yukon: the escapes and the impacts on fishery economics. One thing I would just like to note on the question that was brought up earlier around "What happens if they do escape", the catch programs that are part of the permits are a good idea, I suppose; but the fact remains that it doesn't always happen, and there was a barge that hit a pen in the Broughton Archipelago last year, and there was not any significant effort made to recapture those fish. In fact, the local Namgis First Nation said, "Heh, we've got boats. They're here. Nobody is fishing right now. We could go out and catch these fish." And the company turned down that request.

The Yukon connection to this whole issue is, of course, the question we've all been asked to consider today, and our position at the David Suzuki Foundation would be to ask the Yukon Salmon Committee not to support this transfer of genetic material, and the reasons are because we believe there are local impacts that are significant, and I'll talk more about that later; and when I talk about "impacts", as you'll see later, I'm referring to both economic and ecological impacts. There are impacts to the Clayoquot Sound area; and as a whole, this industry is not a sustainable industry in its current formulation. One of the things that would go a long way towards helping get us there would be -- this industry is not a sustainable industry in its current formulation. One of the things that would go a long way towards helping get us there would be to put this industry, to the extent possible, into closed tank systems. It would greatly reduce the chance of escapes and be a major benefit to the one issue of escapes causing genetic contamination that we're all concerned with here, and we think that this is a possibility and something that we must be working with government and industry and local stakeholders to move towards.

So, the local impacts in the Yukon, from my perspective, the ecological impacts here are smaller. They are especially small if milt is being taken and not eggs. There has been, from what I can tell, a great deal of work done by a lot of local stakeholders to improve the returns and the escapements. I don't know that they're at what we would call a "safe" or a "healthy level" for the long term that everyone is happy with, but clearly some good work has been done. There are

people on the ground committed to doing more of that good work. So, unless there were suppressed levels of returns and the programs to remove genetic material where taking females and eggs, it doesn't seem to me that there's a strong ecological risk in the Yukon itself.

The economic risk I would say is potentially much different. It's large and potentially quite difficult. The loss of value of salmon generally is a reality. While B.C. may not set the price, we are primarily farming with companies who do set the price globally. As wonderful as Creative is, there is no guarantee that one of these companies won't some day buy them out; and there is also no reason to believe that the loss or increase or improvement of the way that Pacific salmon are raised in B.C. is going to help that situation. In particular, while wild and farmed Chinook may have the possibility of entering high range markets, the economic reality is that once salmon becomes a bit more of a commodity, the preference is towards the yearround supply; and the wild fish becomes less attractive to especially institutional consumers, because it's not necessarily available yearround. And of course, if it were to happen that a breed of farm salmon were to directly compete with the high quality values that are represented in Yukon River salmon, then that would definitely be a competitor towards the value and the niche marketing potential of your own salmon from this area.

The aquaculture industry is structured with primarily global corporations, obviously not Creative, but with local operations and foreign markets. So, the amount of control that we have in British Columbia over prices, marketing, the demands of the consumers in the various countries is minimal, and any good business needs to meet the demands of its consumers and its shareholders. So, to the extent that we can't necessarily control all those things, we have less control over this industry than we would perhaps like.

Just a quick comment on the loss of the value of salmon, this is just over the last couple of years, and the values have dropped, and the quantities have dropped as well; but even in this bottom one here you can see that the value has dropped significantly more than the quantity and the industry here would like to expand. When the moratorium on expansion was in place, and then, lifted in British Columbia governments and industry announced a desire to have somewhere near 400 sites at some not-to-distant point in the future in British Columbia. Now currently they're not there, but that level of expansion and the level of expansion that we see in Chile, the interest of the Chinese in getting involved in this and the increase in Australia of this type of activity seems to suggest that the volume pressure on the price of salmon is only going to increase. Currently, probably the main thing buoying the price if anything of wild salmon is the fact that it is seen as a distinct and somewhat preferable product to farmed. Clearly there have been direct economic consequences. This is a news headline from last year where the U.S. governments agreed to compensate wild fishermen in Washington and Alaska for price impacts from dumping of foreign farm competitors.

When we moved to the Clayoquot Sound, the economic issues -- or, I'm sorry, the ecological issues go up. That's where these fish, were they to be bred and actually farmed would be, and escapes are, of course, the primary focus of this. The economic impacts are similar to the general loss and the value of salmon and then there's also, I'll talk about a little later, potential negative impact on existing coastal industries. This is a map from the Living Ocean Society of the tenures in the Clayoquot Sound area. The ones that are down here, I believe, are Creative's. There are only two from these individuals, and then Surmacks Subsidiary Mainstream Canada is the other major -- and they grow primarily Atlantics or maybe exclusively Atlantics, I think.

So, escapes do happen, and escapes I would say in the literature have been fairly conclusively shown to have impacts on wild stocks; and I've just taken a brief sampling of some quotes from published literature that talked to that. This is from the F.A.O.'s precautionary approach to species that's been revised every couple of years since 1995, and they essentially say that bringing an aquaculture operation into an area should basically be considered an intentional introduction because they will escape. Just a note on this: The comment around F.A.O. having deemed the feed fisheries sustainable, I'm not sure that's an entirely accurate characterization of what F.A.O. has said. They have said that there is not currently evidence to say that they're unsustainable. They have also published very clear information that the world is in a global fish meal trap and in the not-too-distant future we will require more fish meal than we can possibly create sustainably if we go on the trajectory that we're on. In terms of the escapes, now this is data that I've put together from the Ministry of Aquaculture, Food and Fisheries on B.C.'s website: 72% of the recorded escapes on their data are of Chinook while only 22% percent of the farm salmon in B.C. are Chinook, and we are also seeing a rise in the number of Chinook over the last several years. It's being gone back to, as some of the problems with culturing and rearing have been worked out; and I'm not sure of an explanation for this, but this is taken directly from calculations made on statistics from their website.

Even just last year, these were not specifics, but we had this event last year after an astounding and, for some people, hard to believe escape record of 30 fish in 2003. We had last year 33,000 fish escape that the public at least was not aware of until many, many months after the actual escape occurred. It occurred in May of 2004. The first official report of it was probably sometime in November, and any public awareness was not really until early this year. There have been over 1.3 million escapes in British Columbia since the late '80's. I would characterize unfortunately the approach towards this issue from government and industry as "Don't worry," and I find that troubling. There are many causes for net failures or escapes. One thing that I do want to say is that industry-wide and in the published literature, there is an accepted belief, although it's not well quantified, that there is usually continual leakage from net cage aquaculture, and that that is almost impossible to measure and track; but clearly in the places where Atlantics

have been grown with Atlantics, the interbreeding and the change in genetic makeup of the wild fish stocks has been documented.

So, in the ecological realm, we have general genetic contamination, decreased fitness of the species, reduced survival of the species and lost diversity of salmon overall as the main ecological concerns related to escapes. Now, I'm not going to deal with sea lice or waste or any of those other issues here today, because we've been asked to focus on the issue of genetic material from the Yukon. So, I'll stay away from those. So, the main genetic concern is the interbreeding leading to the farm traits beginning to establish themselves in the wild; and farmed fish you want to grow faster, be a little bit more sedentary and not necessarily have traits that would lead towards survival in the wild. And Mart Gross has been researching salmon and farm salmon for many, many years; over a decade. This particular quote is from a chapter he wrote in a report published by the Rain Coast Conservation Society called "Ghost Runs". So, he is an independent academic, but this particular quote does come from a report published by another non-profit group.

This is from scientific literature. The paper or at least the abstract can be found on pub med a research website. Paul McGinnity is quoted in multiple reviews, many government reviews. His work I don't think is terribly questioned by anyone in terms of its validity. The reduced fitness has been demonstrated. I love that phrase, "extinction vortex". It's not a particularly pleasant phrase, but basically what it means is if this happens in the wrong place at that wrong time with a species that's at risk, it could very well be the contributing factor that pushes them into an unstoppable spiral. One of the reasons we have concerns about some of these genetic-related ecological impacts is because over time they are almost impossible to reverse.

This again, Ian Fleming, a well-known researcher originally from B.C. now on the east coast. He just made a rather contentious and kind of shaking-up comments at the American Association for the Advancement of Science that in his opinion, it's probably safer to farm Atlantics in the Pacific than it is to farm Pacifics in the Pacific. I'm not sure what kind of assessment I have of that comment yet, but he is someone who's been in this research field for a very long time, and his belief is that the risk of interbreeding from escapes with Pacifics outweighs the risks that you see from escapes and possibly other ecological issues found with Atlantics. To me and to the David Suzuki Foundation, to our allies on the coastal alliance for aquaculture reform, this just emphasizes the need to try and put this industry into closed tank systems.

This is from a review by the Scottish Executive, which is sort of the national government to the extent that that exists in Scotland, and it just talks about the decrease in genetic variability and the fact that just by nature, domesticated species have less variability than their wild cousins do in order to help themselves respond to ecological pressure to evolve.

So, briefly on the economic risks, we already spoke about the loss of salmon value generally, and then, the risks of other coastal industries. This is from the Canadian Centre for Policy Alternatives. The coastal fisheries figures include all fishing, not just commercial. The marine industries that are out there currently support quite a bit more economic activity than salmon farming does. Now, granted some salmon farms are in places where there wasn't much else going on at the time, and of course, that has a positive impact on the economy; but in general, if you look at British Columbia, there's more at risk than there is to gain at this point. And of course, we've discussed this several times already.

Just to recap that: The opinion that we have is that this industry in general is not sustainable, and supporting its development into new areas is not something that we'd like to see happen until the key sustainability issues are addressed. Here I just wanted to briefly comment on the organics issue. There are currently no certified organic producers in British Columbia of farm salmon. The certification body in British Columbia, the C.O.A.B.C., has declined to implement a certification standard at this time. They have some very strict standards that they would like to see addressed -- problems that they would like to see addressed before they do so; and in our participation in that process, our finding was that the organic standards that were being proposed for British Columbia made very little difference to the wild fish in some key areas. Being organic says nothing about escapes. The stocking densities being proposed for the organic standards were not significantly different that we think they would alleviate the pressure from disease and parasite transfer; and trying to call fish meal "organic" as a whole is something that is nearly impossible. So, it's a very sensitive issue, and I appreciate the work that's being done by companies who are trying to work some sort of organic model into their work; but I want to make it very clear that there are no organic salmon farms in British Columbia right now. There is a company that has certified some farms organic. It's called "Naturaland", and it's based in Germany. In a review of all the global certification schemes for farmed finfish, the Naturaland was found to be by far the least stringent and the least acceptable by both the organic and the environmental community.

So, the road to sustainability for the industry in our opinion involves both policy, market and industry changes. I won't spend too much time talking about the policy or the market changes; just to say that some of the improved consultation that we see here today and improved consultation with First Nations is definitely a step in the right direction. I'm hopeful that some of the changes that we're seeing in the Ministry, M.B.C., and in Fisheries and Oceans federally will result in a greater level of confidence that this industry is being properly monitored and enforced. Currently, I would not say that that is a wide held belief in the environmental community and in the fishing community and in some First Nations communities. So, I'm hopeful that these changes will help. I'm not encouraged by the degree of support and promotion for the aquaculture industry that I see in both federal and provincial agencies. My way of thinking their job should be to

conserve and protect the wild fish and the wild habitat first and foremost; and anything that happens after that, then they should be regulating. I don't see a role for D.F.O. promoting aquaculture.

We have been looking at the economics of the closed containment. The industry is very resistant. Obviously, it would be a cost to them. We're working with the University of California and Los Angeles and with a group of conservation economists in the United States, with several of our partners from the Coastal Alliance for Aquaculture Reform; and with some people in the industry, clearly in the industry where they are building these closed containment systems, they're interested in cooperating with us. The open net cage industry has been less forthcoming with their cost structures and cost realities. Few people have given us some help offline so to speak. But this work, we have completed the first stage that I'll show you about in just a minute; and the second stage, which is the actual hardcore cost benefit analysis of the two systems is probably about 60% done. We're awaiting some further funding and some improved data to make sure that that is a solid document. This is just an example of what one of the systems looks like. It's floating; it's not necessarily on land. The David Suzuki foundation recognizes that in some cases putting these tanks on land may have a negative environmental impact due to energy costs for pumping water and things like that. So, the floating systems are very interesting in some of these respects. The work that's been done to date that people use to say, "This is not possible," has been the subject of our first stage of economic analysis. From that analysis, the economists that we have worked with have found four major flaws in that work that basically make it unusable for drawing the conclusions that it's been used to draw. I'd be happy to talk with people about this later if they want, but essentially they just don't give the depth and breadth and ability to do economic analysis that are standard in doing true comparisons towards these type of things.

So, finally, we do not recommend that the Yukon Salmon Committee approve this transfer licence for the reasons that I've stated. We think that the status quo will continue to be more negative than positive, but we do believe that there are solutions to have both a sustainable wild fishery, healthy ecosystems and a sustainable farming industry. And I thank you all very much for your time. These are the members of our coalition, the Coastal Alliance for Aquaculture Reform. While some people may feel that the goal of some of these groups is to shut down aquaculture in B.C., we clearly recognize that that would probably just mean it would move to Chile and not do the globe as a whole any real benefit, and I can tell you that the David Suzuki Foundation at least is not focused on that goal. We are focused on trying to make a sustainable industry.

So, thanks again to everyone who was involved in creating this program and in inviting me here. The organizations listed specifically helped with either maps or some research data, and of course, our supporters, our members and our funders, in particular the volunteer who gave me her credit on a flight she had to

cancel to go to Anchorage so I could come here, I would like to thank Ursula. Thanks again.

8.2 Comments & Questions - Environmental and Socio-economic Impacts of Salmon Net Cage Farming

FACILITATOR BOB HAYES: Thanks, Jay. If you've got any questions we've got about 10 to 15 minutes before we eat.

BILL VERNON: Hi, Jay. My name is Bill Vernon. You talk about closed containment, and you seem to indicate in there that the industry doesn't want to cooperate and so on and so forth; and I really don't know whether the industry does or does not, because I don't really talk to it. But one of the things that the environmental groups seem to miss is that all salmon farmers are farming in closed containment systems. Their fish spend from six months-to-two years in a closed containment system. Albeit it's a fresh water system. So, they have significant knowledge about what it takes to run a closed containment system. So, they're not making these comments without real hard data in terms of cost.

So, my question to you in terms of what you're doing in your research on closed containment is: How are you going to deal with one of the most significant concerns relative to farm salmon and wild salmon, and that is disease transfer; because you're pumping huge amounts of water in those systems, and that water has to be treated? How do you propose to treat that water to eliminate the pathogens that may or may not exist in the effluent water going out?

JAY RITCHLIN: There are a couple of the systems already that have filtration and treatment possibilities. The pilot projects that have been done in British Columbia, there was at least one that didn't have anything like that, and there are new ones coming online that have started to institute those. And clearly, one of the issues for closed containment is that it should help the farmers with the risk of diseases that their fish catch from the wild and that then cause problems in their pens. But filtration and on-land treatment and settling ponds are the two main methods that I know of right now.

BILL VERNON: First of all you say "filtration". If you're going to filter out things like viruses, the filters are going to be so small that the amount of water coming in relative to the size of the pipe that you would have to discharge the effluent, it doesn't work, okay. It will plug up is what I'm saying. So, various things like faeces, feed waste, scales from the fish and so on, all these things are going to plug those filters. So, again if filters won't work, what other alternatives are you looking at, because we have discussed this in the industry, albeit I'm not involved anymore, but we have discussed this; because it is obviously something that we recognize has been proposed. So, what are the alternatives given that those filters won't work?

JAY RITCHLIN: Well, I'm not an expert on the filtration systems in closed containment. I'll say that right now. I can find some people who are better at that if people would like. But the issues that I know, from my experience with the pulp and paper industry, is that nothing works when you first start trying it; and there are a lot of smart engineers out there who are just dying for a problem to solve. So, U.V., ozonation, settling ponds, there are a number of different opportunities to address the issue of filtration backup due to small pore size, and those are things that I leave to the engineers and the technicians clearly to work out, the people who are expert in doing those things; but I believe that there are systems available now that do address those problems. That's my understanding. I stand to be corrected on that, but my understanding is that they have systems that do filter and treat the effluent waste before it's returned to the main waterbody.

BILL VERNON: Just one more thing, because it's relevant to the escapes. I won't go any further in that one because both of us are out of our element, but the other issue you talk about is closed containment solves escapes. If you have an escape in a closed containment system, it is actually a positive effect in there. In other words, you're pumping water in and you're pressurizing a system. If something occurs, a barge hits that or whatever, everything goes out; because it's like popping a balloon; everything discharges. So, again I'd like to know how you propose to solve that problem in your closed containment system relative to escapes?

JAY RITCHLIN: I would just say that the resistance of the solid systems and the closed systems to escapes and regular leakage is much, much higher than the open net systems. I would presume that we would still have secondary netting as a backup for any sort of failure and the types of netting you all use when you're handling your fish, I would expect to be in place.

I would also think that in many cases, some of these closed containment systems would probably end up being closer to shore. They wouldn't need necessarily the depth and the amount of flow that the open nets do. So, they could be closer to their off-loading and handling areas. All those things would go to reduce escapes.

TIM RUNDLE: Tim Rundle with Creative Salmon. I think later in the day we can talk a little bit more on escapes, that's going to come up; and I don't mean to go on and on about this closed containment. We actually met with Friends of Clayoquot Sound and the representatives from Sargo up in Tofino probably about a year ago now to discuss some possibilities in closed containment. At the time, the picture of the Sargo System you show is now hauled up on a beach, pulled apart, unless that's a newer system; but some of the discussions around it at the time were, "How are you going to power these systems, especially in remote areas?" So, now you're running diesel generators

24 hours a day and additionally, how would you deal with failures and the density issue. The close containment, to make them economically viable, the environmental groups are saying you load them up with high, high densities to make it run. So, now you have high densities. The chance for failure is very high. So, in literally 15 minutes that company can be out of business running a diesel generator. So, how would you deal with those kind of issues?

JAY RITCHLIN: Well, I've been working with our climate change and alternative energy people to look at some of the opportunities to assist and supplement diesel. Already diesel generators run at a number of plants. I would say that in general the research on the ecological footprint that I've seen between the wild fishery, captured fishery and the aquaculture industry is that already the aquaculture industry is far more energy-intensive than the wild captured fisheries. So I'm very cognizant of the energy impacts of closed containment. I think it's sort of a life cycle analysis, cost benefit analysis that goes into that.

In terms of catastrophic failure, I guess I don't know how to answer that question, other than to say that if a storm wiped out all your nets or if a ship lost control and went through all your nets, you'd potentially be facing the same thing; and most mechanical systems that are used in industrial settings have backups. That's how they're set up to run.

TIM RUNDLE: I'm sorry, just one other quick comment there is that lot of these trials -- I mean, salmon farmers are trying these closed containments, they have been doing a lot of the pilot studies on it and I just wanted to throw out the comment that almost every one of them has failed in some way so far. As far as even the tank farm near Cedar in British Columbia has gone under a number of times because of catastrophic failure. So, it was definitely a large issue.

CRAIG MCKINNON: Hi, Craig McKinnon, Yukon Salmon Committee. I was wondering what the David Suzuki Foundation's opinion was on the argument about genetic health of natural systems and escaped net caged fish, of let's say Chinook; as well as the argument between that and fish hatcheries used in those various streams.

JAY RITCHLIN: It's funny, that's been coming up a lot lately; and I want to be very clear that the David Suzuki Foundation does not support large-scale enhancement-based hatcheries. At the minimum, the concerns raised by the Pacific Fisheries Research Conservation Council in their making sense of hatcheries report are concerns that we share. I have been accused several times of being a hypocrite by industry people who say that we somehow support hatcheries while we don't support farmed salmon. It's not the case. We are not advocates or supporters of enhancement hatcheries. We recognize that there is some place for recovery hatcheries or restoration

hatcheries or, in some cases, the types of hatcheries that you may have here at the dam; but purely pumping fish out into the system to increase catch yields I don't think is good for the genetic systems, for the genetic integrity of wild fish populations.

I also know that the research that's out there on the interactions between farmed and wild is showing a drift in genetic makeup of wild fish around the U.K. They are showing decreased fitness and survivability, and there is basically not very much question out there that this can and will happen. So, I guess also part of my answer is that if we're already doing things that are not helping the integrity of wild genetic stocks, the argument that this other one isn't quite as bad as the one that we've already got, it's still an additional potential insult, and I use that in the biological sense, to the resource. I don't think there's a justification for it.

BILL HARROWER: Thanks very much; a good presentation by the way. I do have a couple of comments that I think I'll leave until later but maybe one principal question right now, and that is a slide that you showed where you said the ecological impact is high and potentially irreversible.

JAY RITCHLIN: Right.

BILL HARROWER: And I want to ask on what basis and what data you actually draw that conclusion, based on a couple of things. One, first of all, the SAR, which was done in 1997 suggested that this was not the case; and I could argue particularly in the case of Creative Salmon, because they haven't expanded that much in the interim. So, really the SAR reflected the status quo now very largely with respect to Creative Salmon.

FACILITATOR BOB HAYES: Bill, could you tell us what the "SAR" is?

BILL HARROWER: My apologies for that. The SAR was the Salmon Aquaculture Review, which was conducted by the provincial government and took about a year to do. During that time there was a moratorium on the issuance of new salmon farm licenses, and in fact, the moratorium was not lifted until the recommendations of the SAR were enacted. So, that was about 2001, I believe. So, that's the first part of that question.

And the other part of that question is: Have you consulted with the local First Nation to find out whether your assessment of the ecological impact is in accord with theirs, the Clayoquot?

JAY RITCHLIN: So, in terms of the first part of your question about the potentially irreversible nature and relation to the SAR. The potentially irreversible nature comes from a review of the literature around genetic escapes, publications by people like McGinty and Fleming and also, the commentaries on the precautionary approach to introduction of species by the

Food and Aquaculture Organization, where they clearly state that impacts of this type tend very strongly to be things that cannot be reversed in short time periods.

In terms of the Salmon Aquaculture Review and the comments there, while there was a moratorium on new licence issuances, the industry did increase its density significantly during that time. The provincial government says that they did not lift the moratorium until all the recommendations were addressed. Our assessment of that is significantly different. We don't feel that the SAR recommendations have been adequately addressed in most cases, and I know for a fact that our government relations team from the Coastal Alliance has been to brief your minister, Bill, several times on our differences of opinion in the achievement of the recommendations of the Salmon Aquaculture Review. Creative, I understand they haven't expanded their sites. I don't know how their densities have changed since 1997. So, maybe Creative is still in the category that was commented on by the SAR. I intended to come here and not just talk about Creative either positively or negatively, because I don't believe that we are only talking about Creative, although today and this next decision is only about Creative. But the Salmon Aquaculture Review very clearly said that, "Under current conditions, we see a very limited impact from some of these things," but those current conditions changed, both in the density of the stocking of most of the farms and now in the number of tenures that have been approved. So, I think that's definitely worth noting.

I personally have not talked to the Tla-o-qui-aht First Nation about their concerns. My approach here today is to not attempt or pretend to speak on behalf of any First Nation. I very much prefer to let them do that on their own. I am, however, very certain that it is appropriate for me to speak about what the scientific literature around the world says for the potential of these issues here in British Columbia; and in terms of the Tla-o-qui-aht First Nation, much like First Nations have territories that they like to try and focus on and respect the actions of other in, environmental groups try to do the same. The Friends of Clayoquot Sound are the on-the-ground group in that region, and I tend to let them do that sort of discussion.

FACILITATOR BOB HAYES: Just in the interest of being done here in five minutes roughly I'd just like to get to these last two comments, and then, hopefully you'll be able to address that comment this afternoon. Thanks.

CRAIG McKINNON: To follow up with that last question is what what's the David Suzuki Foundation's policy in incorporating traditional knowledge and the interests of First Nations, as well as the local communities? I know David Suzuki, being very scientific and maybe everyone who is a part of the foundation is very scientific, but I guess what steps are you taking to incorporate that type of traditional knowledge into your presentations?

JAY RITCHLIN: First off, the David Suzuki Foundation is a hundred percent supportive of First Nations rights and title. We have strong links to a group known as “Turning Point”, also another coastal First Nations initiative that the main point of the entire organization is to advance those rights and title with an ecological understanding of the issues involved. The Musgamagw Tsawataineuk Tribal Council is an active member of the Coastal Alliance for Aquaculture Reform, and there is no question that traditional ecological knowledge is highly respected by David Suzuki himself and by the foundation as a whole. That’s the answer to that question.

GRAHAM VanTIGHEM: Hi, Graham from the Fish and Wildlife Management Board. I’m finding that a lot of the questions that you guys are asking between industry, government and yourself are possibly going over my head, but one of things that I think really stood out was it sounded to me like your argument about the closed systems, between yourself and the fellow from Creative Salmon, was quite unusual to me. It sounded to me like you’re advocating for a closed system, and Creative Salmon is advocating for being able to continue to use our wild oceans as a filter for their business, which was just kind of remarkable to me. I would think that an organization, which sounded as advanced as theirs would be more supportive of innovation.

However, the question that I have for you, for the foundation is: I was looking at the slide from the Fisheries and Oceans fellow at the beginning and there were sort of different stages of regulation; and in the end, you essentially draw a circle around a fish farming operation in the middle of the ocean, and there’s a number that’s based on what’s acceptable within the circle and what’s unacceptable, which I find really interesting, because in the Yukon we make those decisions with Yukoners in mind, and I’m not really sure that a lot of British Columbians had their input on a regulation like that. But how do you feel about that standard that was set for specific operations?

JAY RITCHLIN: As Andy mentioned in his presentation, this is a new approach for DFO, and it was a new approach by DFO for me today. So, I haven’t been involved in that sort of standard setting. I think that it’s a fairly strong opinion in British Columbia that people outside the industry have a very hard time getting input into some of these decisions. The Canadian Environmental Process is one where well over 95, up to 99, percent of the projects that go to CEAA get through an assessment and get approved. So, it’s not necessarily a process that stops things. The mitigation and things that are required, it’s hard to assess in a general sense, but the idea seems to be to find a way to get projects done. I think there’s a lot of good things about CEAA. I think it’s a very interesting process, but most fish farms right now are only required to go through the lowest level of *Canadian Environmental Assessment Act* screening. It’s called “a screening”. The input to that from non-industry stakeholders has been limited in the past, although we’re getting a little bit better at it. It does mean that organizations like ours and our allies and our coalition

basically have to be constantly monitoring the CEEA registry and ready to do a detailed assessment of every site application that comes through in order to participate at any meaningful level. There's a huge amount of staff time and work and expertise that goes into being able to do that. We're building that expertise all the time in our movement and in our organizations, and I think that we're getting better at it. Thanks, everyone.

FACILITATOR BOB HAYES: I think it would be good to thank all of the speakers that have presented today with a little round of applause from Yukoners for coming up and providing this information for us. Thanks to Andrew Thompson, to Spencer Evans and to Jay Ritchlin for those presentations.

We do have one note from the secretariat. If you haven't registered yet and you came through and you didn't put your name down, please do so because you'll get the products of the workshop if you do that, and it's easy for Andrea to track you down there.

(Discussion, re: scheduling)

Thanks so much for your attention and let's continue.

Meeting Adjourned at 12:18 p.m.

Meeting Resumed at 1:05 p.m.

9.0 Introduction - John Vincent (Kyuquot First Nation)

FACILITATOR BOB HAYES: The next speaker is John Vincent. John Vincent is from Kyuquot, which is on northwestern Vancouver Island on the main ocean side of the island, and both Caroline and I have had the pleasure of going to this beautiful little coastal village two or three years ago. John is a person that worked in the finfish industry from the bottom up. He started working at it as a labourer, and he evolved and developed an expertise on this. He's a commercial fisherman, and he wanted me to be very clear that he doesn't consider himself an expert. He considers himself somebody that's very experienced, which is, in many ways, an expert, as we all know. Without any further delay I'll let John make his presentation.

9.1 A First Nation Experience with Salmon Net Cage Farming Industry and the Benefits - John Vincent (Kyuquot First Nation)

JOHN VINCENT: Thank you Bob. First of all I would like to say "thank you" to the First Nations people of the Yukon for allowing me to get up here to speak on this salmon issue. My name is John Vincent, and I'm a member of a small band of people in Kyuquot on the west coast of Vancouver Island. I started in the workforce when I was aged 16 as a logger. I went

logging. I did that for a few years, and I bought a commercial fishing boat. I also did that for a number of years. Commercial fishing in those days was great. There was no such a thing as coming home “skunked”. There were a lot of salmon. It was fun fishing commercially, but today that’s gone downhill, as well. Commercial fishing and logging is almost nil in my area. There’s a little bit of logging, a fair little fishing. From the community that I’m from, each household had a commercial fishing licence. I had one. I have a son who had one; but today our people, out of a whole bunch of us, we have only got one licensed vessel left. Due to the lack of wild salmon stocks, they have all, sort of, curtailed the commercial fishing only to a few days, a few weeks, out of a year.

So, due to that downturn, there was salmon farming. It started up when I was still commercial fishing, which was run by a fellow by the name of Richard Buchanan. His farm company was called Infargon 4. I went up there, asked the site manager what the chances are of me getting employed with them after fishing season was over. He said, “I’ll let you know in a few weeks.”

After the salmon season was over, I got a radio call from a place called Centre Cove, which is at Kyuquot. I didn’t know where Centre Cove was. We never had much to do with that. He said, “Come on up. We have to interview you for a job on the fish farm.” So, I did. That was in about 1988. That’s when fish farming was just starting up. There weren’t many fish farms anywhere in those years, and everything was done manually. We changed nets manually, we fed fish manually. I did a little bit of fish feeding then but not for too long. Due to my experience on a commercial boat, I became a boat operator for the company because I understood the workings of radar on the boat. So, due to my experience as a commercial fisherman, I went operating a boat for the company; and I didn’t have to have any extra training to do that, because I already knew how. Even now I have a small craft operators certificate in my pocket. Also, we didn’t have any mechanical machinery at all. Everything was done manually; seven farms then and now.

1990, as you will view, there are two types of fish feeding there. One is done manually by scooping feed out of a feed bucket, which sat on the sidewalk next to the fish pen. In 1990, there was an auto feeder as well, but it was a different type of auto feeder. As you can probably view, there’s an A-frame by each pen with a bar across from pen to pen, and there was a bar that sat right in the middle of the pen with a bucket on it, which held about 50-to-60 pounds of fish feed. It was a fairly simple fish feeding auto fish feeder. And on your right, 2005, that’s an auto feeder, which you will see in most farms today, which is run by a computer in the main feed shed with tons of feed flowing through three-inch plastic pipes.

I didn’t have much to do with fish feeding. I could see this operation from when I’m on the sites; but due to being a boat operator, I didn’t have much to do with fish feeding. So, I didn’t understand too much of the technical stuff about fish

feeding, but today everything is so simple. Not so simple that these guys, these operators, are well trained to do the job; it's all run by computer in the main feed shed, and they just go from pen to pen, as you saw earlier, with these cameras in each pen, watching the fish feed and monitors on the sidewalk, "walkways", as they call them, watching the fish feed. I used to go over there and watch them do it when I had some spare time. And they've got remote controls, which can either add more feed through the pipe into the pen or stop the feeding when they see the fish are fed by looking into the monitor.

It's fairly sophisticated, yet some of our people are working in fish farms in my area. I worked that one for 13 years, but again, like I said, as a boat operator. I started in on this feeding where cameras pick up the feed. If the camera picks up any feed coming down from the service, that's an indication the fish aren't eating the feed anymore, and that's when the feeders do their thing with their remote controls and stop the flow. They've got so much time in each pen to feed their fish. These guys that are feeding the fish are well trained in their job. Either they come in trained or they do the training on the job, some of them. Some of my people that are employed today up there are doing this kind of work. It seems interesting but, like I said, I didn't get into that kind of work, because I was more valuable on the boat. They didn't have to train anybody to operate a boat. I knew the workings of a diesel motor, how to keep it running, what to do and what not to do. This fish feeding, as I was told, if the feeder wastes the feed, if you see the feed hitting the bottom of the pen, I don't think there's anybody who does that today, due to the high cost of feed. There is no waste of feed. I don't know if there's such a thing as feed on the bottom of the pen, because the feed is so expensive. That's the biggest cost of fish farming is the feed.

I would have liked to have studied, if I knew I was going to need it in later years, I would have studied more on this type of stuff, like, fish feeding and all of that. But because I was operating a boat I didn't think I needed it, but sometimes I wished I had. A

Still on feeding, as you can see, this fellow here is looking in his monitor to see what the fish are doing in the camera, as Spencer Evans showed you at his site. It's very interesting to see a bunch of fish down there feeding, because when the camera picks up any site of feed at all, that's when they stop feeding and they move to another pen.

There have been a lot of improvements from the time I started in 1988 until today, a couple years of ago in regards to feeding. I thought it was interesting in my days. We had to do everything by hand. I was commuting from home to the farm site; and my role, as soon as I got to the site, was grab a wheelbarrow, put half a dozen feedbags into it and deliver it to each pen, which held three bags of feed in each bucket. The feeders stood there and threw the feed at the fish, and today it's totally different. It's amazing how improvements can take place. We still own fish feeders. On the left is one similar to the one that I mentioned

earlier, an auto feeder situated right on site. They have two types of feeders. The one on the right is a fellow standing in a boat. He's also got an automatic feeder, but it's totally different from the one that's attached right down to the site. This fellow on the right, he's on the boat and he's got to transport the feed in the boat and he puts into a little hopper, which holds about half a dozen bags of feed or so. I think a bag of feed is about 35-to-40 pounds, and he has to move from pen to pen in this little boat. It's not such a little boat; it's sort of like a little barge, an aluminum built boat. That feeder he's using is run by a small Honda motor, which is attached to an air compressor, and that feeder he's using has compressed air going through it, pushing the feed through into the pen.

Site locations: As I said earlier, I was a boat operator but in time I also started doing the anchoring of the sites. Anchoring means I was working with five-tonne cement blocks, inch-and-a-quarter poly ropes, and one-inch chains. It was not an easy task either when I first started. I started off working anchoring with a small 32-foot-square concrete float with a bunch of Styrofoam blocks underneath it. They also installed, in the middle of this float, a retired seine winch off a seine boat, commercial seine boat, that is retired and it's run by hydraulic power. With that winch in the middle of the float I was able to lift five-tonne blocks off the bottom of the ocean to change the ropes or change shackles. We dropped anchors with the same float. When we had to anchor a site, we'd just hang the anchor blocks on the side of the float with what we call a "sacrifice rope". We attached a chain and rope to it, and we got it into place. We'd just cut the sacrifice rope and down goes the anchor. We had to push our float against the farm site to tighten up the rope so there's not play in it at all. With five tonnes of concrete on the end of a rope, that's lots of weight on a 600-foot chunk of rope. We used about 600 feet of rope, depending on the depth the farm site was set at. Some areas in our area are really deep. They're really deep, and we need lots of rope. Fortunately, we haven't lost any farms sites due to the weather. We've got some extreme weather up there as well. In the wintertime, we get hurricane force winds, and we need good anchoring on each side to prevent the fish from drifting.

So, that was my role. I wasn't so much into raising the fish. My role was preventing our fish from drifting away. I like working. I'm not afraid of any type of hard work. I'm proud to say I have never been on social assistance. I've always worked. I don't like anything given to me for nothing. And fish farming is very interesting. I must also say, too, that anchoring of the sites was interesting because at different locations, different water currents. The more water current there is at a site, you have to use better anchors and bigger anchors.

And this site that you see now is the latest site that we have in Kyuquot. I didn't anchor this. I wasn't there anymore when they anchored this site, but this here site is situated so that Kyuquot would be on your left-hand corner, in that direction at the left-hand corner and the place we call "Fair Harbor" is on the top, right-hand corner; and this site is situated where it serves as a beacon for night

boat travelers. It's very handy. Before, Marine Harvest set that site up, they came to our village and consulted, asked questions, whether it would be feasible to set it up there. This fish farming company never did anything without consulting us first. We had to be on good talking spaces with these guys. As you can see, that site is a few yards off shore. We asked for that, too, so our boat travelers can go inside, as well as the outside; because where that farm site is situated, it gets really rough there in the wintertime, like I mentioned earlier, hurricane force winds.

I remember before I went fish farming I got a 20-foot fibreglass boat, a Double Eagle. I was operating it as a water taxi. At this site that you see on this screen now, I was stormbound along the shoreline there, dangling on a three-eighths chunk of rope with a 20-pound anchor on the end of it. It's not a very secure feeling. But with that site where it is now, we can use that if we ever get stormbound.

The guys are fairly friendly there. You can go in their house, drink their coffee, watch their T.V., the convenience of home. That site anchoring again, there's a lot of strong water current where this is situated at, from the north end of the site flowing down towards the south, very strong currents moving; and this site has to have two-inch ropes every hundred feet, two-inch ropes with three, five-tonne blocks on the end of the rope to hold this site in place. As you can see, there's eight holes there, and each line has 15 tonnes of anchors attached to it; as well as the shoreline there's walk pins, one-inch walk pins, drilled into the rock and held in there by concrete with one-inch chain, as well. The ropes going to shore are weighted down in the middle so our boats can go by without having to worry about hanging up on their ropes, which wouldn't be very good for us. It wouldn't be good for them either, because we'd cut their rope and they'd have to replace it.

This side has severe weather coming from both sides, north and south. North, you get the north wind blowing in there quite hard, and the current is very strong; and in the summertime, because of the strong flow, in the summertime you have to protect the fish from the blank and bloom. I'm not sure if you people are aware of what a blank and bloom is; but anyway, that site has to have a tarp running all around the outside of it. The tarp is about 40, 45 feet wide. Because of the strong water currents, you need lots of anchors to hold that big tarp in there and it's very handy. When they first set up their site there they had small lights attached to each corner, which is required by law. They have to have blinker lights to warn the boaters of what's ahead of them. But because of the dimness of the lights, we approached the company, again we approached them, and asked them to put brighter lights on there, and they complied shortly after. The manager of the site told me one time -- I've never been there at night but he told me, "This place looks like an airport at night when the lights are flashing," he said. "the lights are so bright." I've never been there myself at night. I don't leave home when it gets dark, I might get lost.

Here we're still on anchoring. I mentioned a lot of that stuff about anchoring already. The cages are bigger and better, compared to what we had in our days. Bigger and stronger rope, like I mentioned at that last farm site, two-inch rope with 15 tonnes of cement blocks on each end. Net anchoring, that the nets in the pens, to keep them from drifting like this with the current. In my days when I first started, we used gravel bags to hold the nets in place, gravel bags. The bags we used were the feedbags that our feed came out of to feed the fish. We just tied a half-inch rope on it. Net weights, I would say, were about 50-to-55 pounds each. But we had a couple of girls working on the site. They thought those bags were too heavy, so they cut them, made two bags out of one, which didn't help the nets stay in place too often.

Today, as you'll see on the bottom, I've got some net samples here. I can put it on the table there, what they use today, what they used yesterday. I may be getting ahead of myself a little here. I've got three net samples. One net they used in previous years, which I believe had a breaking strength of 150 pounds or so and the other is a 450-pound test. The other net sample I've got is what they used as a Bret cart, a predator net, which runs all around the sides, and that's weighted down with a lot of cement blocks too; to keep the predators out. So, the Bret net, it stretches from the outside of the pens and it's practically straight down. In my early days again, we used gravel bags and it moved with the current of the water and the predators were able to go in there and push their way into the pen and squeeze the fish juice out of the fish; whereas today they don't have that chance, and they don't have any firearms on site like Spencer mentioned earlier. Nobody has. I think it's against the law now to have any type of weapons on site to keep your predators out. There is just no need for it because of the way they set up their nets now with these Bret nets in each net pen. Each net pen also is anchored with cement blocks attached right to the net. How the net keeps from ripping with all those weights is they have what they call a "rib line" sewed right on the net. Moving Harvest has nets with rib lines 5/8 of an inch thick. That's running right through the width of the net, and on the end of that rib line is where the weight hangs. Those weights are every 25 feet, I believe. The net is just sturdy, rigid; there is no give to it. It's very hard for predators to get in at their fish.

I've seen a lot of improvements from the time I started until today. No fish lost, they haven't lost any fish at all in the last four or five years.

I'll put the net samples out on the table over there with Bob, I believe, and I've got the breaking strength of the nets here now. That's the one, 420 pounds average compared to 150 pounds in the past. They have to get these nets checked, tested by a government official.

Changing of the nets, again a lot different from my earlier days. As you will see on the top photo, it's a net being pulled out today. On the bottom is a net being

made in a net loft in Quadra Island just north of Campbell River. Changing the nets in my days was really hard work. We had to bring in a clean net, lay down a walkway and stitch the clean net onto the fowled one. Then we get on the opposite side of the net pen. A whole bunch of us line up with net hooks, we call them "net hooks" because you just pull the net up, and the fowled one came up and the clean one went down. It was interesting, because when I first started there I was trying to make an impression. I always do when I first start a job. I have to impress the boss. So, I was pulling as hard as I could with these little net hooks, it had a little wooden handle on it, and the hook came off the net and I clobbered myself right in the forehead. I must have seen a thousand stars. That was impressing the boss! Anyway, as you see on the photo on the screen, today they use 100-foot square nets up in Kyuquot, and these nets are being changed. They put the clean one right on the water, attach it to the sides of the cages. They pull the fowled one, out as you can see on the screen, they pull the fowled one out with a crane onto a barge with a big retired seine winch again. It's very simple compared to what we used to have to do, and it only takes a matter of an hour-and-a-half to get that fowled net out from the time they start putting the clean one in. The clean one is in the water already, so there's no fish loss, no chance of fish being lost. We never lost any during our days either, because we were careful; because all fish companies fear that a fish is lost, that's money out of their bank account. I'd probably think the same if I was an operator.

Community benefits - we see the fish company in our area, there's a lot of benefits to our community. Not only work-wise, we've got some people employed, I was employed, but water taxi service. Crew change days; they use our local water taxi person to change the crew. Farm technicians: six out of eight. Assistant managers: one out of six. I always say to my people in Kyuquot that if you want a higher paying job, I suggest to them that they go back to school and get these higher paying jobs on the farms. I overheard -- we went to an anti-free farm rally in Vancouver a month or so ago, and I heard something over there that I dread and hate to hear. He said, "I'd rather go on welfare than work for \$10 an hour." I didn't make any comment about that, but deep down it hurts to hear our native people talk like that; "I'd rather go on welfare." It hurts me more because, like I said earlier, I've never been on welfare. I'm retired now.

The maintenance - we don't have any maintenance persons up there or a cook. They have a boat up there called "The Bad News", which is run by the owner, Andy's son. It only requires two people to operate that boat, so we don't have any of our own people on it.

Harvesting - this fellow that owns the Haida Joy it's probably a 60 foot retired aluminum seine boat, and he's got it converted to working for the fish farm company, and he does the harvesting right there. When they do harvesting out of these sites they do about 35,000 pounds per harvest, which goes right into the boat. Sometimes they do three of those a day. So, it can stretch into a day and a night. Then that harvested fish goes into a place called "Fair Harbour", where a

truck comes in to pick up the fish. Again it's totally different from how we did it when we were harvesting.

I must say one thing about salmon farming. Not all of us First Nations people are against fish farming. Some of us love to have fish farm companies in our area, because they create work, they help the communities, like Spencer Evans had on his screen; how he helps his community. Marine Harvest Canada does something similar in our area. They contribute to the school, contribute to sporting events. On Earth Day, they come into our area, help clean up. With the equipment they've got; boats and trucks and all that, which is really handy, they take all the refuse out into the garbage dump out in Campbell River or wherever it may be. They're really very handy to have around, not only job wise but helping the community. They hold community dinners, too, for any special occasion if we ask them to. If we ask them for a contribution, they do not hesitate. They probably think about it, but they don't hesitate, they don't say "No." So, there's a lot of benefits in having a fish farm in our area. Again I will say, "We are like any typical community, we have some for it, some against." But I always say to the people that are against fish farming, "You read about it. You read about how bad fish farming is." But, for myself, after working on one, I don't see the stuff there anti-fish farmers write about, detrimental about fish farming.

Us First Nations people, I don't think there's any First Nations people that will take a job just for the sake of working and forget the environment. We fish farmers are environmentalists, too. We care for our environment especially as First Nations people, because it's our area. We live in that area. Besides, the fish farm companies, they have to abide by these rules set by the government. If they don't, there's consequences to be paid. So, there are benefits to having a fish farm company.

Again I will say, I have a few discs in my bag here. It's called "Traditional Speaking". I don't know if any of you have seen it. It's been aired on APTN a few times. But I will leave it with Bob Hayes; and the fellow that gave me these discs, he's the president of this, called "PAA" (Positive Aquaculture Awareness). It's very interesting, it's about First Nations people, fish farming in First Nations territories. If you get time to see it, view it. We're not all against fish farming. We view fish farming as beneficial to our area, not only working on the farm but the spinoffs that the farm brings in, fuel and whatever they may need, water taxi service. I also have a few brochures from the same outfit as PAA in my bag. I'll leave them on Bob Hayes' table, as well.

I hope what I had to share with you people will help in some way or another. I was very surprised when I first got -- I'm going to go back a little bit. When Bob Hayes phoned, I was not home at the time. I was in Campbell River for some reason, and I went home a couple of days later. One of my sons was staying with me, and he was going commercial fishing. I put my answering machine on because I saw there were five or six messages on it. The first one was from Bob

Hayes in the Yukon, “We want you to come to the Yukon to make a presentation about your experience on the fish farm.” So, I went down further to check to see what else was on the answering machine. I checked two more, and another one came on, Bob Hayes again. I couldn’t believe it.

So, I called my son over and I said, “Paul, come on over here and listen to this.”

So, he did, and his comment was, “This guy wants you.” It was very surprising. I’m from the furthest up west on the Island that you can go. Further up west than those guys from Creative Salmon, and Bob Hayes got ahold of me. So, it doesn’t matter how far or how isolated you are, people know where you are. So, thanks Bob.

Again I will say, “Thanks for having me. Thanks for taking time out to listen.” I don’t have any technical stuff to report, because, again like I said, if there are any technical questions you have to ask, I’ve got friends over there who will answer those; but again my role on the farm was a boat operator working with anchor blocks, five-tonne anchor blocks. That was interesting to hear from a Bob Hayes.

I talked to a few of those guys from the office, and time after time on the telephone, I tried to put a face on those voices; but now that I see them, they’re totally different. They’re nicer looking people than I had imagined.

9.2 Comments & Questions - A First Nation Experience with Salmon Net Cage Farming Industry and the Benefits

FACILITATOR BOB HAYES: Thank you John. If you have any questions for John, please come to the mike and you can ask him. He’s a man who’s been out there.

(No audible response)

Let’s get through the next speaker then.

JOHN VINCENT: Excuse me Bob. I will drop these discs off on that table, and the guy that made these discs said, “You’re welcome to copy them, because if it’s going to help you, do so.” Thank you.

10.0 Introduction - Arnie Narcisse (Chair of BC Aboriginal Fisheries Commission)

FACILITATOR BOB HAYES: Arnie Narcisse is from the Merritt area of British Columbia. His biography is actually quite long if you want to read it in the hand out. Arnie is very interested in the rights and responsibilities of First Nations people and access to salmon resources in British Columbia. He’s also very active in terms of conservation. He won the coveted “Roderick Haig-Brown”

Award for some of the work he did on salmon habitat in the Nicola Valley in interior British Columbia. I'm going to let Arnie tell you what he's going to talk about regarding First Nations perspectives and net cage salmon farming.

10.1 The Aboriginal Fisheries Commission View on Net Cage Farming, the Environmental, Cultural, and Socio-economic Impacts of Salmon Net Cage Farming - Arnie Narcisse (Chair of BC Aboriginal Fisheries Commission)

ARNIE NARCISSE: Thank you, Bob. First off, I'd like to acknowledge the tribes on whose territory I'm on today. It's a very important thing for us to do. I'd like to acknowledge the invitation from the Yukon Salmon Committee and my good friend Carl Sidney that I have known for some time and people like Lorelei Smith that I've met recently at the Pacific Salmon Commission. I was recently appointed by the minister last October as a Canadian Commissioner to the Pacific Salmon Commission. So, that should give you some idea that I do have a bit of credibility and a bit of knowledge of what I'm talking about here. We're pleased to be invited to share what we know about the ongoing controversies around net pen salmon farming and the implications to First Nations. Your goal is to answer the question of whether or not your organization, the Yukon Salmon Committee, should support the transfer of salmon genetic material for the salmon farming industry.

I was invited to speak on behalf of the B.C. Aboriginal Fisheries Commission and was asked to share our view on net pen fish farming and why we do not support the practice in its present form. I must emphasize that last comment that I made, "in its present form", because there is definitely a lot of room for improvement. I've been thinking hard about how I can help you with this question by sharing our experiences in British Columbia. It is true that the B.C. Aboriginal Fisheries Commission does not support the salmon farming industry in its present form, but neither do we have a zero tolerance position, as we've been asked to do by some tribes in British Columbia. You need to recognize that there are 202 First Nations in the province of British Columbia, equally distributed along the coast and throughout the interior. So, the perspective on salmon farming activity ranges vastly. Our position is to work with the consensus of First Nations on salmon farming, and I'll go into this in a minute.

I don't know if our experience will help you find your way as you struggle to make a decision. Our situations are vastly different, but all I can do is offer the experiences we have had. In terms of some of the key issues, what gets the most attention are the negative environmental impacts and the economic impacts to fishermen. Social impacts are very real, as well, but they get less attention in the media. There is no question that First Nations are affected by net pen salmon farming. The debate within our community is tearing us apart, from tribe to tribe, within communities and even within families. I'm sure that the folks that have spoken previously can evidence this. The social cost to debating or fighting

this industry are taking a toll on First Nations in British Columbia. The anxiety about salmon farming and the fear that it is poisoning or destroying just about everything in the ocean and the energy that is diverted from important stock enhancement, restoration activities or other aboriginal issues that are critical, like health and social well being, are being left by the wayside.

In terms of this slide, it shows some of the good, the bad and the ugly; the good in terms of the shellfish aquaculture activities that many of our communities have bought into. In terms of the proliferation, I guess in some communities' eyes that's bad, and the ugliness is the sea lice that you see out on the smolts. As recently as a few years ago, we lost many hundreds of thousands of smolts due to sea lice infestation.

In terms of working with the consensus we have found over the years that there is a consensus on salmon farming in British Columbia. All First Nations acknowledge that the integrity of the environment, fish and ecosystems must come first and that salmon farming must accommodate environmental concerns. First Nations are also united on the requirement for meaningful consultation by the provincial and federal governments before licenses, tenures or any kind of permits are granted for fish farms.

Fish farming is consistent with environmental sustainability. No consensus among First Nations. After that, admittedly the consensus breaks down. Some, indeed maybe the majority of the First Nations, believe that net pen salmon farming simply cannot meet that goal. Others believe that with conscientious and objective monitoring, research and adaptive management salmon farming can be managed sustainably. If you look closely, you would find a range of conclusions about salmon farming represented within the First Nations community: From those that say they don't belong anywhere in B.C., those that say "Not in my territory," to those that have partnerships with fish farm companies. First Nations in B.C. are by no means unanimous on the place of net pen salmon farming in British Columbia.

In terms of B.C.A.F.C.'s approach and position, it is not the place of the B.C. Aboriginal Fisheries Commission to pick sides in a controversy that divides First Nations. Our mandate as an organization is to facilitate consensus around issues of concern and to facilitate dialogue with each other and others, all the while respecting each other's First Nations sovereignty. Given that, our approach has been to find a way to contribute meaningfully to the ongoing debate yet maintaining a neutral position as to whether net pen salmon farming belongs in our waters. I've been quoted several times as saying, "That each First Nation makes the difficult choice to participate in this industry for itself." We do not condemn our neighbours for choosing to participate in fish farming, but neither can we ignore our neighbour's right to live free from the effects of salmon farming. It's a tough balance, and we don't know if it can be done. The communities that have engaged in salmon aquaculture, as has been stated

before, are literally between a rock and a hard place. The commercial fisheries that they once depended upon are now gone, are now all quotaed out. The logging industry that they relied upon behind them, the trees have all been cut down. So, there's no more future there. To the communities of Kitsoo and Ahousaht and Kyuquot are these sorts of communities that are evident up and down the coast. They've literally had to make this difficult choice for themselves. So, that's why we make this statement. It was two-and-a-half years ago that I said this. We're still trying to maintain a balance, but sometimes it's not easy, not when courts find the provincial authority for permitting fish farms remiss and failing to adequately consult the First Nations. As recently as March 2nd the Homalco people down in British Columbia were successful in maintaining the injunction against Marine Harvest. Marine Harvest now has to engage in meaningful consultation with the Homalco people as a result of the Haida decision that came down that talked about the special accommodation requirements for First Nations. And a permit was granted after the Haida and Taku River cases, which confirmed the Crown's duty to consult, and again this was in November of 2004.

We get criticized for not taking a position for or against, but we believe that if a province-wide organization like ours takes one position or another, it gets dismissed by everyone, by First Nations who don't agree with the position taken, by the federal and provincial agencies and by the scientific authorities. It's not easy maintaining a neutral role, but we believe that we can contribute to at least getting the concerns of First Nations heard and dealt with, which is ultimately our mandate as an organization.

In terms of our experiences from 2002 to the present, the B.C. Aboriginal Fisheries Commission has been raising concerns about salmon farming since before 1997 when we advised the multiyear Salmon Aquaculture Review Committee about First Nations environmental, economic and social concerns on the impacts of salmon farming, including siting criteria. Our concerns were noted in the 1997 salmon aquaculture review, despite which the environmental assessment office, after reviewing the salmon aquaculture report, concluded the industry was a low environmental risk. The controversy re-ignited in 2002 when the province decided to lift the seven-year moratorium on salmon farming expansion.

In terms of our responses, the B.C. Aboriginal Fisheries Commission recommended strongly against the lifting of the moratorium, citing the knowledge gaps existent. We also responded by calling a public summit, inviting all parties: First Nations, environmentalists, industry, governments, even academics, to present information on the five topics of environmental concern. These were disease, you can see, siting, impacts to human health, fish farm waste impacts and escaped farm fish into the environment. It was an opportunity to engage in open, honest and respectful dialogue and an opportunity to share information and to hear different perspectives, much like we're trying to do here today.

At the first summit in 2002, we enjoined delegates to present their various points of view on the topics. Based on a discussion from the floor, we crafted 14 recommendations. They had to do with acknowledging there was much more research needed, more requirements for monitoring, better policies, and engagement in discussions around policy development. Sadly the only one the delegates could agree on was the first: To hold another summit in one year's time to report back on any progress on issues that had been raised.

We did hold another summit a year later and found that not a lot of progress had been made. Despite words from government and industry committing to continued dialogue and working together to deal with issues, not much had changed. Speakers still had the same concerns. A distrust and unwillingness to work together still pervaded. Indeed, we declared an impasse and decided that our efforts would be better spent working directly with First Nations on tools to monitor and research their environmental concerns for themselves.

So, in terms of environmental monitoring and research we've become tired of seeing our people's concerns ignored by government and industry officials. No one was taking our observations or impacts seriously. In 2004, we decided to embark on a capacity building program that would allow First Nations to initiate and lead high quality objective, credible research. We set out to prioritize research and monitoring issues in partnership with three very different and distant coastal First Nations groups. We got a list of priority research concerns. We inventoried the capacity the groups have and what they need. The three groups were the Ahousaht, the Clemtu ? and the people around the Broughton Archipelago. It's no small matter. Many of the groups we are working with don't have technicians, scientists or equipment, or even project coordinators in place to do this kind of work; but we keep hearing about the millions of dollars thrown around out there to do research on environmental issues. We thought it was about time that some of that got diverted back to the people it was intended to benefit. So, we drafted a strategy and a framework for getting a program started.

Last spring the B.C. Aboriginal Fisheries Commission began a First Nations-led research partnership to study contaminants in marine traditional foods and potential links to salmon farming operations. Since then, the B.C.A.F.C., along with the Ahousaht First Nation, Kitasoo Fisheries and Musgamagw Tsawataineuk Tribal Council have been carrying out a scientific study with the expertise of University of Victoria-based research scientists. The study cost \$300,000 and was funded by the Assembly of First Nations and Health Canada Contaminant Study Program.

The study is testing for concentrations of persistent organic pollutants, heavy metals and antimicrobials in the tissues of the clams, prawns and rock fish in the territories of these three communities; Clayoquot Sound, Clemtu and Broughton Archipelago. The scientists are comparing levels of contaminants in tissue from

locations near fish farms to locations far from fish farm influence. They are also exploring the use of tracer chemicals to distinguish the source of contamination, whether it be fish farms or otherwise. It's interesting to note that this whole study started from an anecdotal comment from one of our elders over on Gilford Island who expressed some concern about the black slimy clams that were becoming more and more prevalent in his territory and he wanted to know why this was happening. So, they took it to us at B.C.A.F.C., I took it to Diane Irvin, who is a scientist that works very closely with me, and we got in touch with the University of Victoria. Dr. Esitesmonder ? and Adrian Debrune ? and a number of other people and began to talk to them and asked whether they would be willing to participate in a study to determine what was causing these clams to get black and slimy. We have concluded the preliminary aspect of that now.

With no research directed to the concerns expressed by First Nations being undertaken by government or industry to date, this research initiative is an important first step in investigating waste from fish farms on local traditional marine resources.

In terms of the project partners, all our partners recognize the power of conducting a study bound by accepted principles of science to provide honest objective answers free from political interference. From the start, the emphasis has been on designing an objective study, one that does not predispose a particular outcome. The best way to approach a study involving such a mix of interests is with the highest levels of scientific integrity and objectivity. All our partners are committed to supporting the goals of scientific objectivity and credibility. At the present time, we are receiving preliminary results. Not all the samples have been analyzed, so it is still too early to talk about them; but at a team meeting last week at the University of Victoria we were all impressed with the power of these scientific tools. The First Nation representatives from each of these communities saw first hand how the clams they had picked up on the beach last summer were translated into numbers and data that may, in the end, paint a picture and give them some answers to questions they've been asking for years, "Why are the clams black and slimy?" We see this research study as an open door to related areas of research. We are submitting other research proposals to continue this work and to expand it to other related topics. In this way, we are facilitating First Nations' ability to get information they can trust and to have a greater capacity in the decision making process so that we can have the tools we need to make the choices about salmon farming that we want to. We know that First Nations are demanding consultation, but they are not stopping there; they are demanding accommodation. This has been upheld by the Haida and now the Homalco decision of the past month. Research into First Nations' questions and concerns will provide information that they can take with them as they seek the satisfactory accommodation.

In terms of the question that is posed here, all I can respond with is a statement to the effect that you cannot replicate nature or her benefits.

With that, I'd like to thank you for the opportunity to come to address you, to give some of the perspectives that we, in British Columbia, have as a result of our exposure to this industry. Again it's been very difficult task to try to maintain a middle of the road, higher ground stance, if you will, to prevent being drawn into either camp. So, with that again, cookston ?. Thank you.

10.2 Comments & Questions - The Aboriginal Fisheries Commission View on Net Cage Farming, the Environmental, Cultural, and Socio-economic Impacts of Salmon Net Cage Farming

FACILITATOR BOB HAYES: Thank you Arnie. Thank you for your patience with our technical problems. Any questions for Arnie?

ARNIE NARCISSE: You don't have to be afraid.

FACILITATOR BOB HAYES: You don't have to be afraid of him. You should be but you don't have to be.

ARNIE NARCISSE: Yes, those of you who know me...

STYD KLUGIE: Your First Nations in B.C. are doing these studies on the effects and impacts on the ecosystem and the salmon and whatnot. We here, the First Nations in the Yukon, like, Selkirk, we're initiating similar research on the salmon for the spawning on this side of the continent or the area, which is similar to what you are doing. We're conducting these studies to have baseline data to basically prove that there is salmon where, for instance, DFO has a green book, which say there might not be salmon in certain areas, and these are in response to mining activities and similar studies that you have. Just one other question is what are the impacts that are happening on these coastal areas that you have? I know that the closer to the mainland or the land is the most productive area of an ocean. So, these impacts that are happening on your studies, how long do you think it takes for the recuperation of the environment from these activities?

ARNIE NARCISSE: Well, that's basically what we're trying to determine now in terms of the study; and as I indicated earlier, the following practices that are engaged in by Creative are a hell of a lot better than what the majority of the industry are doing down in British Columbia right now. The mentality for the -- I guess on a spectrum, scale of spectrum, if you had Creative here and you had the rest of the industry here, I would say that the spectrum is somewhere in here of where we are in terms of the activities that they do. At least they're attempting to look at the issues and concerns of the local First Nations. The other industry players basically go by DFO and B.C. approval, and it doesn't really matter what the hell the tribes say. That's why the Homalco took Marine Harvest to court. They literally planted a fish farm operation right in the

bay, right in front of them, without any accommodation, any, “How do you do, can we put this here”? They tried to cover their ass by saying that, “We did consult with them,” but they didn’t. They didn’t do an adequate job; and as of last November 4th, with the Haida decision that came down with this special accommodation requirements entailed within it, I would suggest to the First Nations people here that you look at that decision very hard, very rigorously and look at how that can protect your interests here in terms of protecting the wild salmon stocks that you have and continue to protect those habitats that they depend upon.

Lorelei, you’ve got no questions, not even a “How are you doing”? I met Lorelei down in Portland, and I just have to commend her and that gang of ladies that worked with her on the Trans-boundary panel. They’re doing a hell of a job on you guys behalf up here. Thank you very much.

11.0 Introduction - Joe Sullivan (Yukon River Drainage Fisheries Association)

FACILITATOR BOB HAYES: We’re going to go right into our last speaker is Joe Sullivan, and he’s with the Yukon River Drainage Fisheries Association. Joe is somebody who has a wide variety of experiences. The best experience that he has is he’s going to come up and talk without a Power Point. I really appreciate that. He’s got a handout on his talk, and he’s just going to speak directly to you, which is something really novel. I don’t think I’ve seen that for a while and I appreciate it. He’s done a lot of work in other places in the world, as well. He worked in Zambia. His experience is restoration projects. He’s also worked on the Exxon-Valdese oil spill in Prince William Sound. So, he’s got a wide experience on issues in Alaska related to salmon, and without any further introduction here is Joe Sullivan. He’ll tell you what he’s talking about.

11.1 Alaska Commercial Fishers Perspective on Economic Impacts of Transferring Yukon River Salmon Genetic Material to Net Cage Farm Fishing Industry - Joe Sullivan (Yukon River Drainage Fisheries Association)

JOE SULLIVAN: Thanks, Bob. Yes, I do work for the Yukon River Drainage Fisheries Association and what we are , we came together about the same time, I thought it was kind of curious, about the same time that Creative Salmon got started on their Yukon project. We came together as an organization because we have difficulties between upriver and downriver people, different needs, and they always seem to be fighting about different things. So, we figured well, hell, if we can just put together an organization that will try to work by consensus, maybe we can deal with our issues before they get to some government agency that has to make some decisions somewhere. So, what we are is an organization of both subsistence and commercial fishers who are

largely Native, about 90 percent, and we've got about 10 percent Caucasian people also involved, and the two major native groups are Athabaskan Indians and Ubc ? Eskimos. When I first became aware of this meeting and was asked to make a presentation here I thought, "What is it I can tell you about what we do and what our concerns are that would make a difference to you." Before I did the Exxon-Valdese oil spill thing, I was also a fish biologist for the Alaska Department of Fish and Game and that's an issue. I've noticed that on most of the presentations here environmental consequences are an issue. But whether that turns out to be real or not in the long run for you, it's your problem more than it is our problem because the mouth of the Yukon is so far away. But the problem that we really do have essentially comes down to money, in that we're afraid that if aquaculture, the farming of Yukon stock: Chinook salmon, does succeed that it will compete with our wild Yukon fisheries; and while competition is a fact of life around the world, our fishers don't have a lot of alternatives, is what I'm getting at, to commercial fishing.

That's essentially what I've put together here and is getting past around now. To try to figure out how to translate that, I didn't have a lot of time to put this together and was trying to get it done last night and early this morning to get to you. So, yesterday I thought perhaps the best way to deal with the money issue would be to try to put it into Canadian dollars, rather than U.S., and of course all my sources are U.S. dollars. So, I got here last night, went to the bank because I figured, okay, I can always get an exchange rate at the bank and figure that one out, but I was about 20 minutes late. So, I thought, well, I'm in Whitehorse and they have this great African beer that I learned to drink in Zambia, it's called "Castle". So, I went down to the liquor store, and they had a little sign there that said, "Fair value exchange rate 1.15." That was their rate. So, what you see here in all the dollar figures that I put into this is the Whitehorse liquor store exchange rate. So, that's what you've got, and if that's wrong I'm sorry. Castle is good beer, anyway.

Now, I'm still not quite there on this. So, I'll have to tell you that once you get past what I have actually written, when you look at the tables in the back, these I have borrowed from other people. So, that's all in American dollars. So, I'm sorry about that, but I didn't have time to convert all of that last night. The point then is what is it that we do on the Yukon? Virtually all of our members are subsistence fishers. In Alaska as I'm sure in the Yukon Territory, as well, we have what's called a "mixed cash subsistence economy", and what that means is that whatever you do for a living that creates money nevertheless helps you to support your subsistence lifestyle. Most of you in this room probably understand that. It's really difficult sometimes for a government to figure out how to tax that, but that's their problem; and for us, then, we still have difficulties between upriver and downriver people, because there's much smaller commercial fisheries for our upriver folks than from our downriver folks; and in some places there hasn't been a commercial fisheries in five or six years. So, the people in the upriver area, they still need cash. So, they do it in some other ways than commercial fishing,

and they sometimes give the people downriver a hard time for commercial fishing. But the downriver people will tell them, "You know, look, commercial fisheries, that's our means of supporting our subsistence lifestyle." So, they're not making big bucks at this. If you look at commercial fisheries around the Gulf of Alaska and the north Pacific, the average commercial fisherman even with depressed prices, makes a lot more money than our average commercial fisher does. If you go to the second page here, you'll look at some of the figures that I put out here, and the very best year with the very best on the very best part of the river you can see that, I think I have about 18,000 was what the average fisher got one particular year. More like it, what a commercial fisher would make might be one or \$2,000 worth of salmon, and that's gross. That's the next vessel price. That still doesn't deal with his gas prices and his oil and those other things. But nevertheless, that's a very important part of his family's income. Again you can read that for yourself in here.

So, what does that translate into then? One of the other things that I did, I got some help from a number of different people, trying to get the facts and figures on this, was take a look at if you went to a typical Alaskan village to see what their local economy is like, and I did that, I chose two of them, one's Emmonak and one is St. Mary's. They're both in the lower river, but Emmonak is kind of right in the middle of the best fishing area. The fish are dime bright when they come into Emmonak. You get really good prices for them. That's where it's happening. You move up to St. Mary's and there's still a lot of dime bright fish, but there's some blush fish too and frankly the market has changed these past few years and those blush fish, even though they are wonderful tasting fish and because of the high fat content they taste so much better than most of the Chinook around the Gulf of Alaska, there's still the visual problem and you don't get as much money for them, if you can sell them at all. Then you have problems with Chum salmon, and the market has fallen off for that entirely. One of the things that YRDFA is trying to do now is to get some marketing projects going so that we won't be completely dependent upon the Japanese market, as we have been in the past and then maybe we can start selling some of these fish in the local market on this side of the Pacific instead. We're trying to get that going, and hopefully that will help prices; but again if you look at one of these tables that I have attached here, you can see that the prices have been all over the map for a long time. However, for Yukon River stock in general, the prices have been higher than they normally are for Gulf of Alaska fish.

So, one of the reasons I'm here today is to say please don't undermine us on this issue, and that's what we think continued use of Yukon's stock and needs will ultimately do. I have a Ph.D. in Fisheries and Light Aquacultures, and I don't believe that there's any aquaculture organism that's not susceptible to being successfully cultured, given enough time and energy and research put into the method. Where I grew up, Channel catfish was the difficulty. It couldn't be done. It was a really high priced product that people really wanted. It fell to commercial

culture when somebody figured out that all you have to do is put a milk can in the farm pond and they'll spawn. That's all it took, and things changed.

So, Atlantic Salmon, once upon a time, were a difficult species to raise, but that changed. In any event, I guess what I'm saying is that on the one hand Creative Salmon is saying that they've been working at this for a long time, and I'm sure that they have. I don't expect them to not succeed ultimately, though, if they continue to go down that road.

So, anyway, if you look again at the bottom of the second page and start looking at some of the comparative normal family incomes for a place like Emmonak and St. Mary's, you'll see that we're talking 30,000 to almost 40,000, something like that for those two locations. If you compare that to a place like Whitehorse or Anchorage, that's about half and that's just dollars. So, what I'm saying is that if you try to make a living in those places, and you make, say, \$30,000 and of that five-to-ten percent is salmon, Chinook salmon, harvest, that doesn't look like a lot of money, 1500-to-\$3,000 something like that; but it's a very important part of your economy if you have limited choices to make a living down there. There are not a lot of other things you can do. You can't go mining. There are government jobs you can do. You can work for the tribal government. You may get a job with one or two stores, but there are not a lot of economic choices as there are in a place like Whitehorse or Anchorage. You can see that the Anchorage economy and the Whitehorse economy are about the same for the average income.

Some of these figures that you see here are a little bit bizarre, and I hope you can take them in a kind of general framework rather than a "this is exactly how it is"; because if you look at my sources of information, you'll see that while we've got a 2000 census for St. Mary's and Emmonak and a 2001 census for Whitehorse, and then, I've thrown in some average prices or some estimated gross prices for permits or the estimated gross of a permit holder for particular years, of course, that varies around the map. So, I wouldn't put these things down as hard and fast; but if you're interested, then I would say go to the next page after that and go to the Internet and look up some of these things. I have a whole bunch of Internet addresses that you can go find out what the truth is about what we're making for a living, what we're not making for a living.

Our people in the Yukon believe in wild salmon. We could have gotten into aquaculture in the form of ocean ranching, which is the only legal form of fish culture in Alaska, a long time ago if we had wanted to do that but that, kind of, violates -- again like with some of the First Nations in B.C., ocean ranching violates the cultural relationship that people have along the Yukon, at least on our side of the border, between the fish and people; and in the market place as someone else mentioned earlier, people are more willing to buy wild salmon at a higher price because they are perceived to be healthier and tastier and so forth and they don't have all of the chemicals that have been used to keep the fish healthy or the things that have been prepared in the feed and so forth. So, we do

believe that wild salmon, at this point, is a superior product that we should be able to get a better price for, and we're trying to not only do that, we're trying to get a better price for it, and we're also trying to ensure that by working with the federal and state agencies, with the D.F.O and with tribal organizations, we are trying to make sure that we have sustainable runs of salmon for future generations.

But, like I said, we would also like to not feel that we have to give up prices. I mean the value of these salmon when Yukon stock come on line as a marketable product, eventually that's going to hurt us. That's our perception at least; and like I said, right now we're trying to overcome that through marketing efforts and trying to make sure the salmon runs continue forever.

I don't know what else I can tell you. I don't really have 30 minutes worth of things to say but that's basically our position. We would appreciate it if you don't continue to export Yukon River stock gametes to British Columbia or to anywhere else for that matter. That's where we're at. Any questions?

Thank you.

11.2 Comments & Questions - Alaska Commercial Fishers Perspective on Economic Impacts of Transferring Yukon River Salmon Genetic Material to Net Cage Farm Fishing Industry

GERALD COUTURE: Just a comment, Joe, and I think, having been involved for over 20 years with you and your colleagues I know where you're coming from; but I'd like to comment and paraphrase and see if what I'm thinking is what you're saying. I'm a trapper, and I live on essentially martin. Martin are my bread and butter. Martin are real high-grade fur, sable, known throughout the world as the very best.

JOE SULLIVAN: Right.

GERALD COUTURE: And there is a fur farming industry that, in normal years, really doesn't affect me at all. But what I have noticed is when the mink farming industry releases a lot of pelts onto the market, even though they're not martin, they're not sable, they don't compete directly with me, it's a replacement product and the price of my martin goes down in the market. This is what I'm observing. I understand, then, that you're saying the same thing. Although the fish may not compete directly with you the release of fish of this quality into the market that's cultured, especially in the markets you're looking for, is going to affect your people on the market. Is that essentially what you were talking about?

JOE SULLIVAN: Yes, that's essentially it, Gerry. I mean everybody in this room knows, and someone mentioned it again at the beginning

of the day, that when Atlantic Salmon got out there in vast numbers in the market, the price of every salmon went down. However, after that, people started finding out that, "Well, gee, if I take care of my Sockeye or Chinook or whatever better, I can still find the niche market and I can still get it." And I don't know the trapping industry, but I suspect that if you found somebody who doesn't like mink, that really wants martin, you might be able to sell more of those, but you'd have to go find them. That's kind of where we're at right now is that we're saying, "Okay, we're going to have to ..."

There was a time when Alaskan Salmon and wild caught B.C. salmon were all the salmon there were, and we had a sellers market. That's not true anymore. Now you've got to take care of your salmon. It can't be bruised, it can't be folded around on itself, it has got to be cold from the minute it gets in the boat and all that other stuff; and we're learning to take better care of the fish all over the place. So, we are competing, but to have a Yukon fish out there that's a wild Yukon fish and a Yukon fish that's not a wild fish, some people get the drift but not everybody will get the drift. We're going to lose if large numbers of cultured Yukon stock fish get out there on the market, and it's going to say on the label, you know, "Yukon Chinook salmon". You look at this and you say, "Well, I can pay two bucks a pound for this or five bucks a pound for this," and they both say "Yukon Chinook", what are you going to do? Are you going to read the fine print that says this one's wild and this one's not? Some people will, but otherwise it's going to hurt us.

One of the other things I'd like to mention, too, that is in here, as well: When you look at how many people are affected by this, in general we're looking at about 650-to-700-and-something commercial permits up and down the river, which translates to about that many families directly being impacted by it; and of course, the money moves through the community, as well, so that other families are also impacted. I don't know how many people are involved with Creative Salmon as far as investors and people who have jobs and things like that; but for us, with a commercial salmon fishery, even though any individual family isn't making a lot of money even when times are good, there are a lot of people there that are being impacted and a lot of people for whom \$1,000 or \$2,000 or \$3,000 makes a real big difference for them, as far as whether they can survive or not.

You've got to remember, too, that in the bush communities in Alaska and a lot of them I think here, as well, we don't have roads where you can drive to the villages and transportation costs are cheap. Transportation costs are cheap here in Whitehorse and they're cheap in Anchorage, and what you can get for \$30,000 here or in Anchorage is not the same thing you can get for \$30,000 on the Lower Yukon. Transportation costs are high. So, every buck that you can make by whatever means is important.

BILL VERNON: Yes, Joe, I'm Bill Vernon. It seems that we've developed this either or approach. You know, it's either this or it's that.

JOE SULLIVAN:

Right.

BILL VERNON:

And I came out of the commercial fishing industry, so I do understand that component, and I have a lot of friends who have suffered over the years as a result of downturn in prices, low catches and so on and so forth; but one of the things that I look at in this is that Yukon River Salmon has an average weight of somewhere in the neighbourhood of 20 pounds. It's going to be very difficult in the foreseeable future that Creative Salmon or any other company is going to be able to grow them to that average size, and I will acknowledge right here that there is nothing better than a wild salmon and certainly a wild Yukon salmon. Even as far up the river as here, it's still bloody tasty. But it seems to me that there's an opportunity -- and we can compete, as you call it, or fight with each other or however we're going to go. It seems to me there's an opportunity here where there could be some back scratching go on, some benefit where Creative Salmon is -- and I'm not speaking on behalf of Creative Salmon by the way, this is my point of view; but it seems to me that there could be some effort that could be applied on both sides if we could open up some discussion between the interested parties to try and further the desire of everybody and that at the end of the day is to try and support the price, maintain the price, and if possible raise the price. I just wonder if that's something that your group is interested in because I think there is some potential mutual benefits.

JOE SULLIVAN:

I don't know the answer to that to tell you the truth. One of the things that we have a hard time with in the Yukon is competing with our Chum salmon in particular, with Alaskan salmon hatcheries in southeastern Alaska and in Prince William Sound. Even though Alaska says, "Well, we don't allow fish farming," in many ways those of us on the Yukon don't really see a big philosophical difference between ocean ranching and fish farming. It's just how long you're keeping those fish in a cage.

Within the state of Alaska the ASMI, the Alaskan Salmon Marketing Institute, doesn't really want us to -- they want us to market our fish as Alaskan salmon, rather than competing with this Alaskan salmon versus that Alaskan salmon. Yet for the niche market, we have to have something -- this Chinook, the Yukon Chinook, that we have in our hand here, for us, we've got to have some reason to ask someone to pay twice as much as they would for some Kenai River Chinook Salmon, which is also wild. Then, of course, we get into the oil content and that sort of thing.

I think that when you slam the door on discussions between groups, that's not good. So, I'm not saying that there isn't some way that we could cooperate and both mutually benefit and in fact, that's, as I said, that's really how YRDFA came to exist was the people that were pointing fingers at each other finally decided it would be better to stop beating each other over the head and try and figure out if

they had some mutual interest that they could work together on. So, I'm not saying that that's not possible. I'm just saying that for many philosophical reasons the wild salmon and the high fat content are the two things that we feel we have going for us, but we don't have vast quantities of salmon, and that's what we are afraid that eventually Creative Salmon or others could ultimately create. I don't know the answer to this. The very, very, very long answer is "I don't know the answer."

DICK MAHONEY: You mentioned that most of the people along the river live a subsistence or a mixed economy lifestyle, --

JOE SULLIVAN: Yes.

DICK MAHONEY: -- and the small incomes that families derive from the fisheries is generally just a small addition to that. What fishery does that income principally come from?

JOE SULLIVAN: Lately it principally comes from Chinook salmon. Again I do have that information in here, and it is on many of the websites that I mentioned. But, for example, 10, 15 years ago, of the commercial fisheries for salmon on the Yukon, and it's pretty much almost exclusively salmon on the Yukon, about 86, 87 percent of that was Chinook salmon. Lately, because of the decline in prices for Chum salmon, it's been closer to 98 or 99 percent Chinook salmon.

DICK MAHONEY: Right, I understand that. I was meaning the commercial fishery or the subsistence fishery?

JOE SULLIVAN: Well, those percentages of the commercial fisheries, the subsistence fisheries really depends upon where you live on the Yukon. White fish, for example, is a very important subsistence fisheries the further you get up the Koyokuk River, which is one major tributary of the Yukon and as you go up the Tanana River there is a strong run of both Chinook and fall Chum salmon that go up the Tanana; but beyond a certain point you really run out of salmon, and the subsistence fishers there are mainly relying on whitefish.

DICK MAHONEY: Within the subsistence fishery, there is a provision in the customary trade program to sell subsistence-caught fish.

JOE SULLIVAN: Yes.

DICK MAHONEY: So, what component of those subsistence-caught fish are really commercial sold fish?

JOE SULLIVAN: Oh, that's a good question to which I don't have a good answer. That's an issue. That's certainly a big issue and one that YRDFA is trying to address. We now have a dual management system on the Yukon because of the subsistence controversy. The State of Alaska Constitution allows subsistence fishing for everyone and the federal ENULCA ? legislation allows it only for rural residents. So, because the state and the feds can't come to an agreement on what that actually means and how it plays out, then we now have a dual management system where certain parts of the river and its tributaries are managed by the State of Alaska and other parts are managed by the Federal Government. I'm afraid I've just forgotten a bit of what your question was. I don't mean to avoid it but I'm afraid I'm a little short on sleep today.

DICK MAHONEY: The essence is that within the subsistence fishery is the customary trade provision. A certain amount of those fish, which are caught under subsistence provisions are sold as a commercial product. So, that does contribute largely or minutely to --

JOE SULLIVAN: Yes, for certain individuals that can be a significant amount. Relative to the State of Alaska and the Federal Government, that is a very small amount and here's what happens with that: When you catch a subsistence caught fish, under the Federal system, customary trade applies and that's fine; but then, if you want to sell that fish, you suddenly get into difficulties with the Department of Environmental Conservation and health issues, and you also get into difficulties with the Department of Revenue so that if you have legally caught a fish and want to sell it under customary trade, then you have to meet these other requirements, and the State, not recognizing customary trade, isn't going to easily let you do that. So, one of the things that YRDFA was trying to do was to help people figure out how you can take -- fish strips, for example, is a very popular way of preserving fish along the Yukon; and some people, under customary trade, have made a significant amount of money off of fish strips. But on the other hand, in making those fish strips, they don't meet the Department of Environmental Conservation's health standards for consumable product. So, in that sense, they're doing that illegally. Of course, if they can't meet the D.E.C. regs, it's very possible that they don't report that on either their Federal income tax or other things that would show where they're being sold. So, there is an element out there that is undocumented is what I'm getting at.

If you look, for example, at where the money is going up and down the river, because that information is in some of the handouts attached to this, the vast majority of the money is being made in the Lower River where fish are going into the export industry to Japan, to the Lower 48 and elsewhere. That's where most of the money is. But what proportion appears in the customary trade, I can't tell you, and I don't think it's documented. Again a long answer, I'm sorry.

FACILITATOR BOB HAYES: Any other questions for Joe?

(No audible response)

FACILITATOR BOB HAYES: Thank you. I think we should give a round of applause to all three of the speakers: Joe Sullivan, Arnie Narcisse and John Vincent. I appreciate them speaking on time and on schedule.

(Explanation of process)

Meeting Adjourned at 3:10 p.m.

Meeting Resumed at 3:30 p.m.

12.0 Open Discussion and Summary of the Day

FACILITATOR BOB HAYES: The intention of this session, this next hour or however long it takes is to engage more in getting information from the speakers. You have a really good opportunity now to speak with people who are dealing with aquaculture issues, salmon aquaculture issues in Alaska, British Columbia. Here is your opportunity to get information. The Salmon Committee is considering this important question: "Should the Yukon Salmon Committee support or reject the continued transfer of Yukon genetic material to the net cage farm fishing industry?" To make this the most productive part of the day, it should be focusing on that particular issue. It's about Yukon Chinook salmon. It's not about general aquaculture practises in British Columbia. It's about that topic. I know that's where the Salmon Committee wants information and advice in the end to present their recommendation, which they are planning to develop over the next few months. Here is your opportunity to get more information. So, Salmon Committee members and public RRCs, this is where you get your chance to ask those questions. So, without any further delay, we will open the floor to microphone questions, please.

CHAIR CARL SIDNEY: This is not my question. When you guys did your presentation, there were a lot of people who had questions to presenters and didn't have time to ask them. My question is to Bill and Andrew from the first presentation. In your slides, you guys talked about a therapeutant use. I've never heard of that. I don't know what it is, but if you could explain to me what that is; and the other one is drug use. These are record keeping that you guys presented. So, if you have record keeping of that kind of stuff, my question is: What is that therapeutant I think it is; and the other one is what kind of drugs are used in fish farming?

BILL HARROWER: Okay, I'll take a shot at that one. It's a good question. I'm sorry if that wasn't clear. Therapeutants and drugs are basically the same thing. Therapeutants are drugs that are used for fish treatments, and just to let you know, any drug that is used for fish treatment, that

must be done under a veterinary prescription; and there are specific withdrawal periods for all drugs that are used. So, depending on the particular drug, you might not be able to market your fish for 60 days or 120 days after the use of that drug, depending on what it is. So, one of the jobs of the fisheries inspectors is to go over the drug records and find out what was used, and then, when the fish were marketed to make sure that all fish that were marketed are not carrying any drug residues. So, that's what that is about.

ANDREW THOMSON: Just from a Federal perspective, all therapeutants or drugs being used in the aquaculture industry have to be approved by Health Canada prior to release for use by the veterinarians.

BILL HARROWER: And just one final point, there are, relative to any kind of other agricultural industry, very few drugs that are actually licensed for use in aquaculture. They have a few antibiotics for dealing with certain things. They've got a couple of other drugs, but they've got just a very small group of drugs that are actually able to be used. They do not use hormones in aquaculture, which is a common misconception about drug use.

JAY RITCHLIN: If I could add one thing: the only one currently used in the industry is not licensed for its existing use is called Slice™ (emamectin benzoate), and veterinarians can prescribe it as an off-label emergency use to control sea lice, and the Raincoast Conservation Society has published a report, called "Diminishing Returns" that has a fairly significant section on industry use of that chemical in Canada, primarily British Columbia.

GERALD COUTURE: A bit of a comment and a question along with it. The comment is one of relief, in that I've just learned that my term on the Salmon Committee is over. So, I won't be faced with the responsibility for this decision; but at the same time, I want everybody at that table to understand the difficulty that Salmon Committee members face in making a decision. Arnie, you outlined some of the things that tear you one way or another. From the start of this debate, I've been torn one way or another. I listen to my Alaskan companions, and I agree with them. I see the benefits that Creative Salmon has done, and I have no doubt at all that Creative Salmon is probably the very pinnacle, the very best of that industry in British Columbia. I hear that from everybody. Nonetheless, Salmon Committee members have a decision to make, and it's not going to be an easy one.

My question is this, and it's mainly to the people from the Suzuki Foundation and to you, Arnie: You indicated that your support for the industry in general is based upon some changes, some significant changes; and could you provide for us, both Arnie and Jay, those things that you think have to take place so that the industry can improve to the point where you felt that it was a viable, sustainable industry. We've heard verbal comments. We need this in writing if we're going to start looking at making this decision; and again, I'm not going to precede that

decision because I see the difficulty in making it. I know what I'm toward. Like I say, I'm kind of glad my term is over. So, that's my question and my comment. I appreciate what each of you has done today. I think it's been a useful exercise, and I really appreciate it.

JAY RITCHLIN: If you're just asking will we provide a written summary of what we believe needs to change for the aquaculture industry to be sustainable, yes, we can provide that to the Salmon Committee.

ARNIE NARCISSE: We can do the same; but I suppose the ultimate would be closed-loop containment systems that have the ability to do the filtration that the detractor said couldn't be done. When I held my hands out like that and talked about the range of perspective and the range of degree of diligence of people, I looked at Creative over here and I looked at the rest of industry over here. You know, it's a big range; and as I said in my statement, it's a very difficult task to try to maintain your credibility as an organization in terms of at least raising the profile of these issues. We've had the ability to do that as B.C.A.F.C. because we've purposely chosen to maintain a higher ground role if you will.

I hope that answers some of your questions, and I certainly hope that that day comes sooner, rather than later; because the impacts that our communities are feeling and the divide that I talked about, even within the family units, is a very real situation, and we can't allow that to continue.

SPENCER EVANS: If I may just add a little note about the closed containment system, Creative Salmon has looked very hard at it. It's of interest to us, but it doesn't exist in a technological state at this point in time where you can actually run a production facility in a closed containment system. The technology is not there at this point in time.

FACILITATOR BOB HAYES: What's the main limiting problem?

SPENCER EVANS: There are a variety of problems. One of them, as Mr. Vernon alluded to, was the filtration of the waste water and what exactly are you going to do with the waste water. There are a whole bunch of issues with power supply. Containment systems are a great concept; and believe me, people have tried to work with them, and there is a possibility in the future, but there are a whole bunch of technological issues that need to be dealt with. From a fish welfare perspective, one of the biggest problems is the circulating vortex of water in these closed containment systems. The SARGO picture that you saw a photo of, just like the future SEA System, requires pumping huge volumes of water into a small space; and the vortex of water that is created with this current does not allow fish to properly rest at any time. The water has to circulate 24 hours a day, 365 days a year. The fish cannot rest; and according to our organic standards, this is inhumane, and we can't do it.

The other problem is if you want to use a containment system, you've got to push densities in excess of 20 kilos/m³. Creative Salmon likes to keep our fish at somewhere around 8 kilos/m³ at a maximum. If you push fish density, you use antibiotics, it's that simple. Our standards don't allow us to use antibiotics, so it just doesn't work. It really doesn't make sense. It's a bit of a red herring.

JAY RITCHLIN: I'll refrain because it doesn't have anything to do with genetics, but we disagree respectfully on some of these issues. Some technical issues remain, however, I think it's important to note that some of the issues are related, especially the ones related to costs, are in part related to the fact that the open net cage aquaculture industry gets to use the waters of the people of Canada as an automatic disposal system. They don't have to pay for those costs. So, some changes in government policy and in financial incentive and tax structure could go a long way to evening the playing field economically. I think the research on the technical feasibility is progressing quickly and that some of these systems are far more operationally possible than perhaps might be indicated by those comments.

KATE MADDIGAN: I was having some questions about sustainability, and I was talking to Bill Vernon, and he was telling me that you were using the Natural Step Framework and becoming more sustainable, and I don't think I saw that in your presentation; is that true?

SPENCER EVANS: If you're referring to the triple bottom line philosophy where our economic benefits are as important as our community and the environment, I did try to touch on that in my presentation, and I'm sorry if it wasn't clear; but we try to operate that our economic bottom line is equally as important as everything we do with our employees, our community, within the environment and for our fish.

KATE MADDIGAN: I just thought that it was a selling point, and I'm surprised that it wasn't in there. I guess a lot of people don't know what the Natural Step Framework is. I think it's a good thing, and I think when Gerry says that you're probably the most sustainable fish farm in B.C., maybe that's true. I did see that for sure, but I don't see that with the rest of the industry obviously; and I would be curious does B.C. have an overall sustainable development strategy in place?

BILL HARROWER: With respect to aquaculture --

KATE MADDIGAN: I'm talking about the entire province; because an overall sustainable development strategy would take into consideration aquaculture, as well.

BILL HARROWER: I would say not at this time, and perhaps I'm the wrong person to ask that. With respect to the aquaculture industry, though, what I can say there is I would agree, first of all, that Creative Salmon is really a model to aspire to. On the other hand, I look at the changes that all the companies have gone through in the last 10 or 15 years and the evolution of the industry itself; and certainly some companies are not at the same level that Creative is right now, but all of them have made quantum steps forward. I think if you look, for example, at the fact that other companies have established very sound working relationships with First Nations, as was demonstrated by Mr. Vincent here, working with Marine Harvest. Other companies have also done the same thing. Also, what we have seen -- and here is one place where I will apologize. I used the acronym earlier "ROV" without stopping and thinking that we're here so people may not be familiar with the acronym. What we were talking about there was a remote-operated vehicle; and one of the things we've seen using that is that farms have become very efficient at using food and not wasting it, that there are no accumulations of food on the bottom now, whereas 10 or 15 years ago there would have been. So, they have made great steps forward. Nothing is perfect, but certainly they have made tremendous strides. The large losses of fish that happened during the '80's due to storms, they simply don't happen now in the way that hundreds of thousands of fish were lost during '88 and 1991. Now, there have been some losses of fish, but those have been kind of very specific catastrophes that have happened, a boat running into a pen or somebody spilling some fish somehow; but otherwise, those haven't happened either.

So, we have made some steps forward. I don't know if that helps with your question, but hopefully it does.

KATE MADDIGAN: The question is: Should the Yukon Salmon Committee support or reject the continued transfer of Yukon genetic material for the net cage industry, not for Creative Salmon; and I just don't see it. I don't see the industry being sustainable. I don't see the province of B.C. having an overall sustainable development strategy, and that's very important to me. With DFO I don't see it. You talked about the precautionary approach. I don't see that being followed at all. This is not about Creative Salmon only. This is about the industry. So, I think you have some work to do. I'm not convinced at all actually.

BILL HARROWER: I guess the only response I can give to that is the fact that when we look at individual salmon farms, we are looking at them from the viewpoint of whether those individual operations as we review them before they go in, and then, even subsequent to that, we look at them from the viewpoint then of sustainability on an individual basis. So, we're certainly evaluating the farms themselves from the viewpoint of what are their impacts on the environment? Are those impacts mitigatable? We're looking at that, and we're looking at things like is there a possibility that those farms are going to get

too big to be sustainable. So, we're certainly evaluating those criteria on all farms, and we're doing that on a continuous basis.

SPENCER EVANS: Can I just comment to your question there? The question that the Yukon Salmon Committee is faced with, should it not have at the end of it how if -- this transportation of genetic material, how does that affect the Yukon salmon themselves and the community of the Yukon. Isn't that really what the question is? So, does exporting genetic material into British Columbia have a negative impact on the Yukon people or Yukon Chinook salmon itself?

KATE MADDIGAN: Well, I think that this is something we have to consider globally. We're talking about the health of communities in B.C., as well. So, it seems to me it extends beyond Yukon borders.

JAY RITCHLIN: I just want to make one quick comment about the precaution and the concept of precaution. Andrew's slide mentioned a precautionary approach; and through no fault of Andrew's, the Privy Council Office, the Federal Government has redefined what most people have come to understand the precautionary principle as the precautionary approach. It's essentially just devolved back to a risk management approach with economic indicators balancing ecological ones. The precautionary approach, which some like to characterize as sort of a "Chicken Little: The sky is falling, we can't do anything approach" is not and should not be that. What it should be is that when we have reasonable scientific evidence to indicate that there is serious potential harm, that we must not let the lack of a smoking gun stop us from taking precautionary action. That's no longer what Federal Government agencies are directed to do through the ministerial directive on the precautionary approach.

So, I just need it to be very clear with people that the precautionary principle, as we have learned to understand it through the U.N. and the Wingspread Conference and things like that is not the same thing as the precautionary approach that the Government of Canada mandates its Federal departments to follow; and again, that's not Andy's fault.

CRAIG MCKINNON: I guess my next question follows Kate's as well, the concerns, and I want to generate some debate and answers from various individuals. We understand we're talking about the removal of genetic material from the Yukon, and we represent a small community that almost isn't even part of the aquaculture industry in B.C. We understand the implications of maybe our decision may set precedents with U.S.-Canada relations and international relations. So, I guess one thing I can't help but think is the Yukon Salmon Committee manages salmon in the Yukon, and we provide recommendations to the Minister. Basically, if we said "No" to the removal of genetic material as a recommendation, to address Andrew, I guess, how would

that conflict with your policy, and how much does that weigh in light of economics, global competition and the whole gamut of things.

ANDREW THOMSON: Well, ultimately, as you pointed out, the Yukon Salmon Committee does make its recommendations directly to the Minister; and frankly, I'm not going to speak on behalf of the Minister. The Minister has the ultimate authority to make this decision, and he will obviously take into account your input and your recommendation, and how he weights that against the scientific information he receives from his departmental colleagues will be entirely up to him. I really can't predispose his decision ahead of him.

CRAIG McKINNON: Do you see it affecting any kind of future dealings in other forums that you're related to, like the effects of the decision? Do you see it setting a precedence?

ANDREW THOMSON: Well, it does ultimately lead down a path that may not have been traversed already, in that most Transplant Committee decisions are based on the scientific advice of the people on the Transplant Committee and solely on that advice. I don't know of an instance where external influences or recommendations have come to be a part of that committee decision. However, ultimately the decision is of the Minister, and he has the ability to make the decision on whatever he wants. It may open up the Transplant Committee decision-making process, and there may be ramifications down the road from that, but those are things we will deal with as a department down the road.

ARNIE NARCISSE: I guess your question is about how much does our opinion weigh at the end of the day in terms of socioeconomic studies and other such activities. We've been victim to socioeconomic studies that the Department of Fisheries and Oceans has engaged in. They've got a stable of favourite authors and consultants that they know will paraphrase what they want said. So, I would be very reluctant in terms of, if I was you guys, to engage in one of those things unless you were fully a participant to the development of the terms of reference for such a socioeconomic study.

I tried to alert the First Nations in the audience a little earlier in my presentation to some of the implications of the Haida decision and the special accommodation requirements in terms of consultation. I think that's a lever, that's a power that you folks have that the other non-Native people in the room don't have. So, in terms of that whole aspect of protection of Section 35(1) and the ability to eat your own fish at the end of the day, I think that is going to be a very important thing for you folks to examine.

I talked to you a little earlier about the material that we have at our office at B.C.A.F.C. in terms of the consultation requirements and the implication for

Fisheries issues, and I would suggest that you get ahold of our office and get that material as quickly as possible. Thank you.

PEARL CALLAGHAN: Good afternoon, this is a question for Arnie. I'm Pearl Callaghan from Teslin Tlingit Council. Arnie, when you talk consultation and accommodation, how much consultation are you insisting on? We know that comes in many forms, consultation. Sometimes you speak to one First Nations person, that's "consultation".

ARNIE NARCISSE: Yes.

PEARL CALLAGHAN: And also, what forms of accommodation are you looking at?

ARNIE NARCISSE: Basically all of the issues that we have been relaying since 1997 under the Salmon Aquaculture Review, the issues of siting was one of the first issues that we brought to the table. The present siting regulation, what is it, 100 meters, 300 meters proximity to foodstuffs?

BILL HARROWER: That depends on what the actual resource is. With respect to clams, for example, or bivalve molluscs utilized by First Nations, it's 300 meters.

ARNIE NARCISSE: So, we were insisting on at least a kilometre during the Salmon Aquaculture Review. So, in terms of those messages being heard back then, it's quite obvious that they fell on deaf ears. What we are trying to do is point out to both British Columbia and the Federal Government that the status quo no longer applies. It was interesting, looking at the timeline of the activity in terms of this genetic material removal and how it started with an individual commercial fisherman basically doing it on his own, and then, somebody going to a world fisheries trust meeting and beginning to become aware of the issues around salmon aquaculture and bringing it home to you guys here. I think what you need is a whole lot more information on this front so that you can make your own clearly informed decisions as to whether you choose to export this genetic material. And as I said in the conclusion of my presentation, you cannot replicate Mother Nature or her benefits, and that's what this whole effort is all about is to transplant the good name of the Yukon Chinook to another place so that it can be sold under a brand name product. Thank you.

GRAHAM VanTIGHEM: I have a question for Mr. Sullivan. He's here from Alaska. I get a lot of informational e-mails and I wish I had read these a little closer. A two-part question: First, could you tell me what the regulations are in Alaska with respect to aquaculture; and second, could you tell me what the difference between fish farming and fish ranching is, and I may have another question afterwards.

JOE SULLIVAN: Well, first of all, basically what is allowed in Alaska in the way of finfishing aquaculture is ocean ranching, and that's all. In just a second, I'll explain what that is. The only kind of finfish aquaculture allowed currently in Alaska is ocean ranching. However, shellfish aquaculture is also allowed. So, if you want to raise oysters or clams or scallops, that's allowed. Now, the difference between ocean ranching and fish farming, which is what is not allowed, and again I kind of have a problem with Webster's dictionary on that; but nevertheless what ocean ranching is, is when you at some point in the fish's life cycle release the fish so that it goes out and grazes in the ocean, and then, comes back to where you released it so that you can kill it and make money off of it.

In the early '70's, we had a problem with salmon returns being down, perhaps in part due to overfishing; but largely I think because the environment at that time was not favourable for salmon. So, Alaska created aquaculture associations or the laws that allowed aquaculture associations where commercial fish farmers could get together, pool some of their resources and tax themselves and create an aquaculture association that would allow for ocean ranching. In the U.S., in the Lower 48, we used to have a thing called "free range cattle". This was before times of fences and all that other stuff where you would drive your cattle from Texas to Montana and that sort of thing. That's essentially what we're doing with salmon is raise them up to the right size for that particular species and the ideas that the aquaculture association has for that fish, let them go. When they come back, you harvest a certain percentage of them to recoup your costs. You let the commercial fisherman fish right outside your hatchery or wherever there are terminal harvest areas where you'll plant fish. You'll put them in a net pen for a couple of weeks so they come back to that area and so forth. Ultimately, the idea is to help commercial fishermen. In my perception, there is not a lot of difference between that and fish farming except that fish farming doesn't help the commercial fisherman, and the idea there is to complete the life cycle completely in captivity. It's a process of domestication.

From the Yukon River Fisheries Association point of view, there is some domestication in both elements. In real fish farming where they are captive for their entire lives, that certainly is a process of domestication.

GRAHAM VanTIGHEM: The reason that I asked is because the e-mail that I think I remember reading said something along the lines of there being a valid initiative or something, because fish farming in Alaska was against the law; but it's within a certain distance of the shore, so they were looking at these long-distance, offshore operations, --

JOE SULLIVAN: Right.

GRAHAM VanTIGHEM: -- which then they recently decided they would not support, as well, if I remember reading that correctly.

JOE SULLIVAN: What the drill on that one is that the State waters I think are just three miles off shore, and the ability to farm fish in open waters would fall under the Federal regulations from that two or three-mile limit out to 200 miles to the economic exclusion zone; and right now, congress is looking at creating a law that would more or less authorize that, that would support that concept. One of the things that's being batted around is consultation with the local government, the States Governments, and whether or not they are going to have some element of influence on whether or not that happens.

Our senators from Alaska and our representative in congress are all opposed to fish farming, and they would like to see that provision in there that would allow Alaska to have an opportunity to veto off-shore fish farming if it does become a legal thing to do in Federal waters. That's what that's about. It still, as far as I know, hasn't passed congress.

GRAHAM VanTIGHEM: I guess one of the things, related to what Craig was saying there, we were talking about how people across other borders will perceive the things we do here in the Yukon. We have agreements with Alaskans with respect to non-resident licenses --

JOE SULLIVAN: Right.

GRAHAM VanTIGHEM: -- and we have agreements with Alaskans with respect to the Yukon River, and it seemed like Alaskans don't really support fish farming very much. I think that would be something we should keep in mind, as well, is that we have a lot of agreements with Alaska, and that might be something to consider.

ARNIE NARCISSE: In my short time on the Pacific Salmon Commission, I have come to learn that the country of Alaska only does what's good for the country of Alaska.

JAY RITCHLIN: You can tell, because they call the rest of the country "the Lower 48". The Open Ocean Aquaculture bill has not hit the U.S. Congress yet. It's probably going to happen this year. The Institute for Aquaculture and Trade Policy, iatp.org, has a great deal of information from the environmental nonprofits side on open ocean aquaculture, as well as the Coastal Alliance for Aquaculture Reform website and our publications have a policy on the open ocean aquaculture, as well, for people who are interested in following that up.

PEARL CALLAGHAN: I just wanted to say my question again, Arnie. With regards to accommodation, what are the First Nations looking for when they speak of "accommodation"? Are we talking money? Are we talking a percentage of the fishery, or what is it that they're looking for?

ARNIE NARCISSE: The two or three groups that were here today have found their accommodation, I guess you could say, in terms of the object of employment for their communities. I think they've come to the realization, as I indicated earlier, that they're between a rock and a hard place and had to seek some sort of accommodation to at least keep some of their community members, as they feel, gainfully employed.

Other perspectives on what accommodation is range from zero tolerance. As I indicated many tribes have that position, that they want nothing to do with it. They don't want it anywhere near them to those that feel that with some improvement, they may be able to deal with them; but I would think that in terms of me personally, what I'm looking for is the assurance that the wild salmon that I catch 300 miles up the Fraser River will continue to swim there, unimpeded by fish farms, unaffected by sea lice or disease or any of the other impediments that presently impact them. In the Broughton Archipelago a couple of short years ago, well over a million pink smolts met their demise because of sea lice infestation. This gets to the heart of matters in terms of court cases like *Jack, John and John*, where individual tribes have the ability to catch their own fish in their own territory. When you wipe out those stocks of salmon, they no longer have that ability to catch those fish or exercise their right or practice their culture.

This is equally evident in terms of the Sacona ? sockeye and the Cultus Lake sockeye, which we had certainly hoped would have been listed under the *Species At Risk Act*. Now my good friend, Chief Doug Kelly from the Soowahlie First Nation and Sto:lo Nation can no longer catch Cultus sockeye to feed either himself or his family.

So, I guess these are the range of accommodation. It depends on where you're coming from. I spoke about those people who are between a rock and a hard place. I live 1,000 miles away from them, and my concerns are more with the ability for me to pass on to my grandson the ability to dry salmon. I looked at that little brochure out there, and that's how I put my fish away. I dry salmon like that 300 miles up the river, and that's the most important thing to me is to try to maintain that.

I guess that's why I always talk about sustainability as being the first and foremost requirement. We always talk about our rights and our responsibilities. Sure we have a lot of rights, but we have a lot of responsibility to look after those salmon; and at the end of the day, we as First Nations people have the most to lose, and we have the most to gain with the sustainability of wild salmon.

TIM RUNDLE: I really want to bring back the issue of escapes. This is one of the big issues today. I just wanted to kind of open it up to the floor after I finish with a couple of comments. I just want to let everybody in the room know that first and foremost of our activities on the salmon farm is to

reduce the risk of escapes. That's number one. But what I would like to talk about here is the risk of escape of Yukon salmon, because that's really what the focus is today.

First off, like I said, we try to reduce all risks as much as possible.

Secondly, that's a really big mitigative effect, if there was an escape, is the timing of the spawn. Yukon River Chinook, even though they are in British Columbia, they spawn in August. The South Coast Chinook October-to-November. So, risk of interbreeding in that way is very minimal.

The other thing with the Yukon River Chinook that we've found in the net pens compared to our South Coast Chinook, is that they don't seem as aggressive as the South Coast Chinook; and additionally, we've found they are more susceptible to predators. They just don't seem to have the same ability to avoid -- if we have a net pen, and we can have this net pen the way we have it now is a single internal grower net; external predator net with a lot of weights, and yet somehow, a seal lion still has the ability to get at some of those fish -- and we're talking smaller numbers -- even though the same system, none of our big Qualicum stock would get affected. So, I think that would help play a role if any of those escaped.

I guess the other things you have to think about, just for the transport of Yukon River Chinook, is we go through quite a rigorous application, and we do all of their disease screening; and to use wild genetics, we would need to do a full quarantine before any of these fish could be put in the water.

So, I just want to open it up to the floor, but those are my comments on the Yukon River Chinook.

FACILITATOR BOB HAYES: Tim, did you want them to respond to the issue of escapes?

TIM RUNDLE: Just if they would like to, that's why I was kind of throwing it up there. It's a big topic today, and I wanted to make sure that people understood that from farming them, we know they still have not changed their spawning habits even though they're on the south coast of British Columbia.

BILL HARROWER: A couple of points, thanks, Tim: One of the points that I think should be brought up again just to kind of consider the impact of escapes is that as has been pointed out, there have been very few Chinook lost overall in the last about 15 years. Now, what Jay said earlier was true, that if you looked at the counts overall, probably 77 percent of the fish lost were Chinook; but that incorporates a period of time in which unfortunately the aquaculture industry was not nearly as well structured or as well regulated as it is

now. And if you look at the period post-1991, you will find that Chinook salmon make up a very low percentage of the escapes that occur. I think that's an important point to make.

Secondly, as Tim pointed out, these fish do behave differently in terms of their spawning time; and furthermore, a couple of other points, one being that the Chinook that the industry raises are all female. So, if these fish go to a river and there aren't any males there, that's going to make it somewhat difficult. Some of them will no doubt hang around, but some of them simply will not be able to wait to spawn with males.

The third point there is there is research right now that indicates that farm fish are far less successful at spawning than are wild fish. So, there is certainly some scientific evidence that estimates of spawning contribution in many cases of escaped fish have been grossly overestimated.

I think one point, as well, just to kind of finalize, is that Jay Ritchlin presented some concerns from some geneticists that said, "This is a disaster waiting to happen." On the other hand, there are other geneticists, equally respected, equally reputed, who have said that the risk of genetic impact of farming Chinook in B.C. is very, very low. So, there are two sides to that discussion, and I think both of them have to be put onto the table. Thank you.

ANDREW THOMSON: I really have nothing further to add to Bill's comments.

JAY RITCHLIN: I would just say to the extent that there is still debate around the potential for genetic dilution and the various impacts related to that would to me suggest that it's not terribly appropriate to begin large scale implementation of this practice at this point. A lot of the same things about "They won't spawn, they won't reproduce, they won't come back" were said about Atlantic salmon. Most of them have been shown to happen at least to some degree or another; and with a species that at least genetically is capable of spawning with our local population, it would seem to me to be an unreasonable risk to take at this stage.

I did want to ask one clarification, because my understanding was that there were no Yukon salmon being grown in net cages right now, that this was just being collected for research. So, if I could just get that clarified. I just wasn't clear on that.

TIM RUNDLE: I think, Jay, that was in our presentation, but Creative Salmon has been growing a small number of Yukon salmon as brood stock since 1990.

JAY RITCHLIN: As brood stock but not in production facilities?

TIM RUNDLE: Well, brood stock in net cages.

JAY RITCHLIN: It seemed to me that there were two different comments made, then, because there was I thought a comment in Creative's presentation, saying, "We've been collecting this material, but we haven't been using it."

TIM RUNDLE: No.

JAY RITCHLIN: I guess the comment was you haven't been using it for production.

TIM RUNDLE: Exactly; it wasn't production, and an additional comment was that we haven't used any more wild genetics since 1996. So, from the period before that point in time, we have collected our wild eggs and milt and have been domesticating since that point in time.

FACILITATOR BOB HAYES: Tim, for me, I'm a bit confused. What does "brood stock" mean, compared to production? Am I missing something?

TIM RUNDLE: I guess just to clarify, "brood stock" is just a term for the parent fish for the following generation; and when we refer to "production", we would consider that -- I guess we always carry a small amount of brood stock that we can spawn and create production fish later on. In the case of our Yukon's, we've been carrying brood stock in an attempt to domesticate. Where they get to a point where they seem to be growing well, then we would move hopefully into a production stage at some point in the future.

ARNIE NARCISSE: Needless to say, the stock of salmon has adapted to its own ecosystem due to diversity; but they are opportunistic creatures, as I have come to learn. They will colonize, given an opportunity. I think that's something that we need to be mindful of.

In terms of these creatures being easy to catch by predators, all I'll say is that they're too stupid to know any better, because they've been domesticated. Just like a chicken or any other thing doesn't know any better to run away.

In terms of science and your comment, Bill, all I will state is that if you pay a scientist enough, he will say any damned thing you want him to; and the problem is lack of objective science.

LORELEI SMITH: I have a question for Joe. I was wondering what are the standards or laws in Alaska in regards to genetic transfer, let's say Oregon wants to do the same thing?

JOE SULLIVAN: Right, well, actually I think it's 50 miles, I think you can go 50 miles from one place to the next if I'm not mistaken. So, something from the Yukon to British Columbia wouldn't work; but then, of course, again this is fish farming, not ocean ranching, and all we have is ocean ranching.

When I first got to Alaska in 1979, someone had made a transport of Coho from Oregon to Alaska, and that just set off all kinds of bells and whistles; and at that time, what we had was a salmon transport policy, and because that was only a policy, it didn't have the force of law. Since then, we have gotten regulations that do govern fish diseases and genetic transport distances and things like that; and the idea is if you are going to start an ocean ranching program with any particular stock of fish, the idea is to use locally-adapted stocks. I mean, after all, relative escapes in this case there are always escapes. You're letting them go, right, and some of them are not going to come back to the hatchery. Some of them are going to wander off into other streams. One of the things we found out was that while coated wire tagging was just the greatest thing since sliced bread for a while, if you missed with the coated wire tag, if you didn't get the cartilage right in the middle, if you wound up hitting one of the olfactory lobes, that those fish would have a greater tendency to stray. So, by having a genetics policy where you don't go more than 50 miles from any given location, hopefully if things go bad, they won't go so bad that the fish go and spawn in a place to which they're not adapted.

(No further comments/questions.)

FACILITATOR BOB HAYES: I would like to thank Arnie, Joe, Jay, Spencer, John, Moses, Andrew and Bill for their presentations and answers to our questions. I know there are people who are thinking about questions for tomorrow morning. A couple of people have commented to me they are forming their own questions, and they're appreciative that the group will come back tomorrow morning at nine o'clock roughly for another hour of answering more detailed questions.

So, that's the schedule for tomorrow. We begin again around nine o'clock here.

Discussion, re: schedule and open discussion of issues.

I thank you all for the respect that you always show when we have these workshops for opinions and ideas that you may not share. I think that is something that is special in the Yukon.

ARNIE NARCISSE: Thanks. Unfortunately I won't be here for tomorrow morning's session. I'm taking the eight o'clock flight back to British Columbia. There's some national business I have to attend to. But I just want to thank the committee, I want to thank Carl and the rest of you for your invitation, your kind hospitality. I talked to somebody about the possibility of coming back up here in my role as Pacific Salmon Commissioner to look at the nature of your fisheries, and I look forward to that day. Thank you very much.

Meeting Adjourned at 4:20 p.m. to March 17, 2005, at 9:00 a.m.