Show Transcript Deconstructing Dinner Kootenay Co-op Radio CJLY Nelson, BC, Canada

January 22, 2009

## Title: "Norway British Columbia III ("Organic" Salmon?)

#### Producer/Host - Jon Steinman Transcript – Lindsay McDougall

*Jon Steinman:* And welcome to Deconstructing Dinner and Part III of Norway, British Columbia – the title of our revived series about salmon farming off the coast of British Columbia, Canada.

Deconstructing Dinner is produced weekly at Kootenay Co-op Radio CJLY in Nelson, BC. I'm Jon Steinman.

Last week's episode was a full one-hour exploration into some of the key issues that are currently concerning the many conservation groups who have long opposed the presence of open-net cage systems for raising salmon along the Pacific coast of BC.

From the prospect of massive production increases on individual farms, to the uncovering of significant illegal production having taken place for years, the North American public who consume BC farmed salmon have a lot to be aware of before consuming this controversial food.

On today's episode, we'll spend quite a bit of time on an actual farm site in the Strait of Georgia. It was there where I, along with a group of delegates from the 2008 conference of the Canadian Farm Writers Federation were toured around. I posed some probing questions to our tour guides: the Ministry of Agriculture and Land's Bill Harrower and the BC Salmon Farmers Association's Paula Galloway.

We'll also have the opportunity to hear responses to the tour that were sent to Alexandra Morton—one of the most vocal critics of open-net salmon farms and the key scientist who was pivotal in helping introduce the long-standing and contested debate of whether or not salmon farms are harming wild salmon populations.

Of interest was the number of startling discrepancies that were discovered between what we were told on the tour versus what Alexandra has discovered through her research.

And rounding off the show, we'll hear segments from an interview I conducted with Alexandra back in September 2008, when I sat down with her outside a BC supreme court, as it was her along with a group of petitioners who are now awaiting a decision on their allegation that the province of BC should not constitutionally be permitted to regulate salmon farms in federal waters.

If you missed last week's episode or miss any of today's, they are archived on our website at deconstructingdinner.ca, under the series title Norway, British Columbia.

# **Increase Music and Fade Out**

JS: A few quick announcements to make before we get into the topic for today's show:

Some exciting news to report from the community of Kaslo, British Columbia, who, on January 13<sup>th</sup> of this year became Canada's fourth genetically-engineered free zone. For those who caught our recent focus on the Genetically Engineered (or GE-Free) Kootenays campaign taking place in the interior of the province, you'll recall that there is a campaign underway to turn the Kootenay region into a GE-Free Zone, that is a zone, which, through setting policy at a local level, will not support the cultivation of plants and trees that have been genetically engineered.

Kaslo joins three other jurisdictions in the Province who have also passed GE-Free resolutions: the City of Nelson, the region of Powell River, and Salt Spring Island. The GE-Free Kootenays campaign will continue with their efforts to encourage other municipalities in the region to adopt a GE-Free resolution. More information on the campaign can be found on our website, under the series titled GE-Free Zones: A Community Response to Genetically-Engineered Foods.

As we continue to document the evolution of the GE Free Kootenays campaign, Deconstructing Dinner hopes to provide a resource of information to other communities wishing to do the same. Our intensive coverage of the issue of genetically engineered food is indeed having an impact. In the January/February 2009 issue of the awardwinning magazine The Walrus, an article on mandatory labeling of food containing GE ingredients was published, and Deconstructing Dinner's May 2008 coverage of the topic was used as a resource for that article.

The Walrus circulates 60,000 copies bi-monthly across Canada.

# Soundbite

Another series we've been covering on the show is also in need of a quick update is our Local Grain Revolution series which has been documenting the creation of Canada's first Community Supported Agriculture, or CSA, project for grain. The CSA along with its coverage on Deconstructing Dinner is too continuing to exert a positive influence. An innovative grain-growing project on Vancouver Island for example is now underway and receiving its own extensive media coverage. According to the project's organizers, the Local Grain Revolution series has acted as an inspiration for their work and we'll learn about the project on an upcoming broadcast.

You can also find two articles that I authored about the grain CSA, both published this month in Small Farm Canada and Briarpatch magazines.

## Soundbite

As promised last week during Part II of our Norway, British Columbia series, on today's Part III we'll embark on a tour of a salmon farm located in BC's Strait of Georgia.

It was back in October 2008 when I attended the annual conference of the Canadian Farm Writers' Federation – an organization representing agricultural media and communications from across the country. On the first day of the conference, delegates were able to spend a full day touring aquaculture facilities, one of which you heard last week.

But today we'll visit Thurlow Point, the name of one of Marine Harvest's fish farm sites nestled alongside East Thurlow Island.

Thurlow Point was a good 45-minute boat ride from the community of Campbell River, from which we headed north, passing by Quadra Island, Sonora Island and then arriving at East Thurlow Island.

Similar to the tour of the salmon hatchery that we visited on last week's show, we've posted on our website a series of photographs of the farm listed under the January 22<sup>nd</sup>, 2009 episode.

Also to note: a number of the recordings as part of this series have been recorded in stereo, and we do encourage you to listen through a stereo device for a more intimate auditory salmon farming experience.

Shortly after leaving the dock en route to Thurlow Point, we passed by a pod of killer whales, a truly special experience and one that emphasized the fragility and importance of our marine ecosystems.

(The din of conversation amongst passengers and engine sounds are heard in the background).

Child's voice 1: Did you see that?

*Man's voice 1*: Yes, it's female. You can tell the females because their fin has a kind of hook to it which males [don't have]. There are a couple of babies there too, I think. It's a small family. There are three or four of them. A mom, a dad, and a couple of calves.

(The sound of people putting on lifejackets is heard in the background)

*Bill Harrower*: Maybe while we are waiting for people to come through, [I have] a comment and that is: I've been involved with the industry since 1986. Initially, what you would have seen is maybe some sort of a very primitive float home on log rafts. Some of the pens might have been either native logs cabled together or they might have been wood-framed pens. Now, as you'll see, everything is metal, it's properly engineered, it's properly anchored. You'll see a fair bit of technology here. Before it used to all be hand-feeding. So things have changed tremendously from 1986, over that 22 year period.

One of the things that we experienced was in 1991, we had a tremendous winter storm and even though they thought at that point the pens were properly engineered, they had a number of salmon farms that were literally torn apart by the wind. They had a five day storm when the winds averaged about 60 knots and they were facing waves up to 10 to 12 feet in some places.

JS: So that doesn't happen with these facilities?

*BH:* Well first of all they are better sited, but secondly they are better engineered and anchored, as well.

*JS:* That's one of our tour guides, Bill Harrower, the Province of British Columbia's Manager of Regional Operations for Aquaculture Development based in Courtenay. While Bill sought to instill confidence that the salmon farm construction materials are superior to those of the past, information shared on last week's episode challenged such assurances. It was after all on December 20, 2008, when, according to Marine Harvest, one of their sites was affected by a winter storm and a sea lion. This led to one of their pens, which was holding 45,000 Atlantic salmon, being ripped open.

In Chile, the world's second largest producer of farmed salmon after Norway, another lack of assurance in farm construction was observed. According to Chilean authorities, on December 31<sup>st</sup>, 2008, bad weather caused more than 700,000 mature salmon and trout to escape their pens near Calbuco, the epicenter of Chile's fish farms. Of the 700,000 estimate, 240,000 may have escaped a farm owned by Mainstream (a Norwegian company that also operates here in Canada), and 500,000 from one of Chile's major aquaculture companies, Aguas Claras. It's said that 2,000 of those escaped fish were from a farm infected with the deadly ISA virus that has ravaged Chile's salmon farming industry.

## Soundbite

*JS:* As the tour continued, we were split up into groups, and I joined Paula Galloway, a member and Community Relations employee with the BC Salmon Farmers Association – the industry's trade association. Prior to her work with the BCSFA, Paula was employed with EWOS – an international aquaculture feed company owned by Norway's Cermaq, whose salmon farm division is Mainstream.

Introducing this next clip with Paula Galloway is Alexandra Morton of the Raincoast Research Society, one of the most vocal opponents to open-net fish farms.

Alexandra studied orca whales in Los Angeles before moving to BC in 1980 to continue her research. In 1984 she settled in Echo Bay, a small fishing village in the Broughton Archipelago. We'll be learning more about Alexandra later on the show, but here's a quick clip from my conversation with her, recorded in September 2008.

*JS:* I'm going to be heading on a tour of one of these marine harvest fish farms on Thursday—two days from now, and this farm tour is hosted by both the province as well as Marine Harvest. What are your thoughts on that (here is agricultural media from all

across the country that's going to be gathering at this conference, being taken on a tour by both of these groups)?

*Alexandra Morton:* I would imagine they are trying to encourage investor confidence. They'd like to see their industry grow. The province is clearly in a promotion role with these farms and you're going to see a lovely facility. And this is one the troubles with fish farms: the impact is all under water and out of sight. You're not going to see the dumpsite; you're not going to see the animals affected around it. You're just going to see really clean, fat fish growing fast in farms.

(the din of conversation of the tour group is heard in the background)

*Paula Galloway:* I may as well take a group of people and we'll go out on the farm site too.

Try to stay away from the feed where it is a little noisy right now.

I'll get everyone out, so anyone who wants to join me [come along].

(The steely whoosh of industrial machinery is heard in the background)

Man's voice 1: This is the end of the morning feeding cycle.

PG: It's less noisy down this way anyways.

JS: So that's the feeding system that we heard back there?

PG: Yes, that's the feeding system. So as we go along [we'll let] people catch up ...

(More whooshing in background)

Man's voice 2: Wow. It's quite amazing, isn't it?

*PG:* So this farm site has just entered these fish into the water onto this site in July, so they've been here for just a short period of time. They're about 1200 grams right now, the average size on site. There are almost a half million fish on site here and there are ten pens, so that gives you an idea of how many there are. So almost 50 000... and that is typical for a farm. Most farms are between half a million and 600,000 fish, just depending on what they're actually set up for and their licensing.

What you hear happening and what you see is this is food that's been delivered to the pens. When they've been feeding the fish, what they're doing is they're feeding just as they go along the system so they're not feeding all the fish at the same time. They usually feed two pens at a time and they move it along consistently and what they can do is, in that camera back there, is you can look through and you can actually see the fish feeding. They have kept cameras in each pen that are pointed up at the fish and then as they see pellets coming through they can determine based on where they have that camera in the pen whether they are slowing down the feed or whether they're going to stop it

altogether. So that way they can monitor their feed usage and make sure that they're not using too much feed and that there isn't a bunch of feed going through the pen.

JS: So this feed doesn't float, it sinks?

*PG:* No, this sinks. There are different feeds and different formulations to have feed float, but obviously for this purpose [the feed needs to sink]. At the hatchery site quite often they'll want feed to float because they'll have the fish come right up to the surface. This feed is a little different than what you would have seen at the hatchery this morning. Quite often in a hatchery it's the most sensitive and critical time in their development, so there's a lot more fish meal and fish oils utilized in those feeds. They're very tightly controlled but [there's] also a very broad in spectrum in terms of the nutritional balance to make sure that they cover off everything that's really needed by the fish.

As you get up into the larger fish, they don't need as much of those high-end ingredients like the fish meal ingredients. They can start to do some substitutions [with those things] because it is not the fish meal per se they need it's the nutrition, like the amino acids. So if you can create that balance then you can still have a product that the fish will grow well with. What you're finding now is with the products that we have right now-- so the fish meal and fish oil still constitute part of it, but there is a lot of substitutions of other proteins and oils and the biggest part of that substitution now is with vegetable proteins and oils. So there is a lot with canola products, soybean products, corn products.

*Male voice 3:* It that going to make things cheaper? Substituting with these other products?

*PG:* It would if some of those parts were getting cheaper, but you have to remember that fish are really not very good utilizers of carbohydrates so they don't need that carbohydrate component. Too much of it can be a detriment to their health, so you're really working very much with those parts of it that are concentrated protein. So it's turned into a higher-end products and so some of it is not necessarily low-end cost anyway so there's not necessarily that substitution. What you want to get substitution for is kind of the idea of getting away from the fish meals and fish oils because that's one of the things that people have criticism against the industry. Just this week actually one of the fish feed companies has announced that they were able to they did a large scale research project—they haven't completed it yet but it is going to be completed by the end of this year, and they've basically [with] this research project [determined that] the salmon were net producers of fish—rather than taking in more wild fish than they produce. So they produced 1.2 kilograms of farmed fish protein for every kilogram of fish protein that was used in the feed. So that's a huge change for the industry. I think that's wonderful. That's just brand new this week.

So: we have the fish meal/fish oils, and then you also have wheat put in there as a binder, and then you have mineral packs and vitamin packs (obviously to make sure that the nutrition is all there). And then the final ingredient would be the pigment. And that's a huge cost for the farms, so the amount of pigment they utilize is obviously just to make sure that they get what they want to in terms of the coloration of the fish. One of the criticisms that we have of the industry [is] in terms of dyes. Those [pigments] are not

dyes, they are natural pigment. This is actually synthetically produced so it's produced the same way a vitamin would be produced and it's added to the feed but it is made to be identical to what the fish would normally have in their diet as part of the crustaceans that would have those pigments in them that would be in their natural diet

Male voice 3: If they didn't have the pigment in them, what color would the meat be?

*PG:* If you didn't have the pigment? What we have on the poster here is we have some Chinook that are called White Chinook (not Chinook). Now I've never seen a White Chinook but I'm presuming its flesh is basically white. What the pigment does is it doesn't necessarily ... just because a fish eats it, doesn't mean that their flesh color will change color. They have to have that ability. Salmon have that ability but obviously not *all* salmon do because the White Chinook doesn't. But if you gave the same diet to a cod their flesh will turn red just because they are unable to take it up into the flesh, so it doesn't bind into the flesh. So you [wouldn't] get that color expressed, it would just be passed through the fish...

*JS:* And this is Deconstructing Dinner and Part III of our Norway, British Columbia series – a multi-part series exploring the salmon farming industry off the western coast of Canada.

You're listening to segments from a tour of a fish farm owned by the largest company operating in the province – Marine Harvest. Our tour guide is Paula Galloway of the industry's trade association – the BC Salmon Farmers.

A tour of a salmon farm in audio is of course lacking in a number of respects; and, so again, we do encourage you to check out some photographs of the farm posted under the January  $22^{nd}$ , 2009 broadcast at deconstructingdinner.ca

Now a few interesting comments were made within that last segment. For one, the industry appears to be moving away from the controversial and expensive inclusion of wild fish in the feed of farmed salmon. Instead, the industry is exploring whether the fishbased ingredients can be replaced with vegetable oils.

Now when I first heard this comment made, I was reminded of the direction in which the processed food industry is heading with respect to dairy products – a topic we covered in 2007. Similar to salmon aquaculture companies, many of the larger producers of processed dairy products are moving away from expensive dairy ingredients and replacing them with vegetable oils. That show exposed how some ice cream products produced by Unilever and their Breyers brand were no longer legally permitted to call their product ice cream according to Canadian regulations. Instead, they were required to call their product Frozen Dessert, due to the lack of protein derived from milk solids within the product.

Well upon my most recent visit to a grocery store carrying that same line of Breyers ice cream, it appears that today, all of the Breyers ice creams that come in the blue containers are no longer called ice cream.

As for farmed salmon, well, as of today, the product can continue to be called salmon, but if scientist Alexandra Morton were working for Health Canada, she'd likely work towards ensuring that farmed salmon being fed vegetable oils, *not* be called salmon.

I sent that last clip to Alexandra and she spoke to me over the phone from her home in Echo Bay.

*AM:* Well, my initial comments to the thought of feeding these fish dyes and feeding them vegetable oil is that people aren't actually eating a salmon they just think they're eating salmon. I feel that the industry would be better working with a fish that is built to eat vegetable matter rather than trying to convert a carnivore. But if that's the direction they want to go I suppose they're free to do that it's just in the end the public aren't actually eating salmon they're eating something that has synthetically made to look like a salmon.

*JS:* Now the move by the industry to explore the increasing use of vegetable oils in the feed of farmed salmon is reminiscent of what we see among industrial land-based raising of animals.

Take dairy cows and cattle being raised for beef for instance; in both cases, industrial scale production of these foods sees animals who have evolved to eat grass, instead being fed a diet of corn, soy, supplements, and in some cases, animal by-products.

That has resulted in Mad-Cow Disease, poor health among dairy cows, and in the case of egg-laying hens, eggs that have been shown to be far less nutritious than those produced from hens who are able to forage for their food and/or fed food scraps.

*JS:* You talked about what we will likely see which is probably a really nice farm, and nice looking fish but if we do ask to see the fish, and if they show us the fish, what will these fish look like and how will they compare to what we would otherwise see in the wild?

*AM*: Well they're going to be obese. In the year 2000 I opened over 700 escaped Atlantics and the amount of fat entwining their intestines and their heart and their liver was pretty different from what a wild fish looks like. You can scoop their raw flesh out and make snowballs out of it. You can see the staining of the orange pellets—that's how they get them to be pink is they put coloring in the food. So the fish are going to be very fat. Their noses will be a bit worn down. Their tales will be worn down. But, you know, to the average person they'd just be big fat fish and if you were to look at a farmed chicken or cow or pig it's no different. They're extremely fat. They are a feedlot. They're trying to grow as many animals as fast as possible and in as small space as possible and as cheaply as possible.

JS: We will get to see a fish, is that possible?

BH: You mean up close?

JS: Like to take one out and look at it.

BH: Probably not. They don't like to handle them.

JS: What would they look like versus a wild Atlantic?

*BH:* Not much different. They will be a little deeper perhaps, a little bit fatter. They may, in some cases, have a bit more fin erosion—but not very much. These ones are looking pretty good that way. So the fins might be a little more worn. Other than that, there's not a whole lot of difference between them and a wild fish.

JS: And the meat?

*BH:* Atlantic salmon typically are kind of an orangeish coloured so they're not as red as say a Cohoe or Sockeye or some of the Chinook, but it would be a nice orange color.

JS: Ministry of Agriculture and Lands, Bill Harrower.

In this next clip from the tour of Marine Harvest's Thurlow Point salmon farm, we hear again from the BC Salmon Farmers' Association's Paula Galloway on how long the salmon remain on the farm and how the waste from the fish is handled. The issue of waste seems especially important given there we were on a site that was no bigger than a soccer field, and below us were half a million fish: *that is a lot of poop*.

Male voice 3: How long do the fish stay here?

*PG:* The fish will be here on site between 18 and 24 months. So at the hatchery you probably found out it's about a one year process, or just under a year, depending on what time they actually go out from the hatchery. So you're looking at a three year turnaround. So it's not a quick process. It's not a quick return on your money necessarily.

*Female voice 1:* So all that are here, are they all the same size that you would harvest them all at the same time?

*PG:* That's correct. So they're all entered into the water within probably a couple of months of each other so at the most probably three months from beginning to end and the idea being that every fish on the site will go through the same growth period and then at the end they'll all be harvested at the same time. When you can do that, then there's a couple of different things: obviously if you introduce fish at different points in time you have the opportunity of introducing disease, and so that's not a good thing, but the other thing is it doesn't allow you to necessarily fallow your site. It's very hard if you have fish coming in at different points in time. So because they can get the fish out within a period of time after that they can fallow the site. So usually the site is fallowed for—it has to be fallowed for three months, and then depending on when they actually harvest it might be longer. One of the sites we used for tours last year harvested in February of this year but their first  $\clubsuit$  (0:26:30) that they get probably won't be till the end of October.

Female voice 1: Now why do they have to fallow it?

*PG:* Fallowing allows for the remediation of the bottom, at the benthic [zone] below the farm site. So it lets that area revive itself and renew itself so that you don't get build-up underneath the pen site.

Female voice 1: Oh. Okay.

*PG:* So they do testing before they introduce fish back into the pen site. They'll test the benthic and take a sample, look for the sulfite levels and know from previous examples of what they've had for a base line what that means and whether the site is remediated enough. And then if it has [been remediated enough] then obviously they can turn fish back on. If it hasn't, then obviously they wouldn't be able to put fish back on the site.

*Female voice 1:* Did the fish do something at the bottom?

*PG:* No, it's just the waste that goes through. So there's very little feed that actually goes through but obviously there's 500,000 fish. There's a lot of poop that can go through over the time.

JS: Paula Galloway of the BC Salmon Farmers Association.

This clip was also sent to Alexandra Morton of the Raincoast Research Society, and I asked her if a complete picture of the issue of waste on salmon farms was outlined to the group.

AM: No. One of the studies I've just begun last year is to look for the dump site for each of these farms because as she mentioned there's a lot of poop coming out of these fish. They feed over a ton a day at some points in their growth cycle. And we know it's not magically disappearing. Fish farmers are the only farmers in the world that don't actually shovel manure. So what I found was the farms are extraordinarily well-sited and there is not very much under them or even very close to them in many cases. I drop my sampler in and I get a sample of pebbles or a little bit of shell but if I look around the farm eventually I find these great soft mountains you can see them on my depth sounder and when I drop the grabber down into them I get a green brown paste that basically is the consistency of a soft ice cream. And these things... I'm just in the process of mapping them, but they are quite large. They look like they are many many tens of feet deep. So they're not going away. I'm finding these by farms that are fallow or farms that are active. It's waste buildup over the last twelve years in some cases. So it's not accurate to say that all the waste produced from the farm goes away, which of course is not what she's saying. She's saying under the cage looks fine. And it does. But they've now dumped it somewhere else and the government is not looking at this or monitoring what's going on these enormous mountains of fish waste.

*Male Voice:* So when you talked about fallowing, what is actually – if you could go down to the bottom now – what is down there? What does it look like, how deep is it?

*BH*: If you're on a relatively slow current, smooth-bottomed site, yes you will see an accumulation of food and waste. It will collect under the pens and for a small area around that.

Male Voice: So give me some idea. Like are we talking two feet? Three inches? Ten feet?

*BH:* Oh no. You're probably talking somewhere inches to maybe a foot. That would be the outside, I would think.

*Male Voice:* This would be a dark...[substance]?

*BH:* You're going to get what is called Beggiatoa which is a fungal mat which is the sign of kind of anoxia because the food down there sets up a bit of an anoxic environment so you will get Beggiatoa; but, what happens is, if you fallow the site everything will go back pretty much to background in a very short period of time. And in fact the waste regulations are set up in such a way you have to monitor certain locations around the site and make sure that the impact is not even spread beyond a certain distance. So the thing we have seen as well is when a farm leaves a site if you go there a few years later you cannot tell that there ever was a farm there.

*JS*: Bill Harrower of the Ministry of Agriculture and Lands for the Province of British Columbia.

Now clearly if Alexandra Morton's account of mountains of waste underwater is indeed true, then Bill Harrower's account of where the waste goes is not entirely accurate. As Alexandra suggests, the government is not monitoring what's going on, and we can only be left to wonder if this lack of monitoring is indeed why Bill Harrower and the province are unaware of the long-term presence of waste underwater.

Shortly on the broadcast we'll hear clips from my interview with Alexandra in front of a BC Supreme Court, as her and a group of petitioners are currently awaiting a decision in a case that is challenging the province's regulating of open-net salmon farms. In light of this case, I asked Alexandra, who is responsible for monitoring waste, the province, or the Federal Department of Fisheries and Oceans. Her response signals that there is indeed a confusing level of bureaucracy surrounding the regulating of aquaculture.

*AM:* Well the waste would really be both the federal and the provincial government because as the waste is wafting out of the pen through the water column it would be federal jurisdiction. And then as soon as it settles and collects on the bottom, then its provincial jurisdiction. So the mounds themselves are provincial jurisdiction because they are in charge of the sea floor and they should be looking after this.

*JS*: Another issue surrounding the waste generated by open-net salmon farms is the many dead fish that do not survive captivity.

From the industry and province's perspective, this is likely great news, as dead fish in open-net pens create more jobs, which, as outlined on last week's Part II of this series, is an argument used often by both industry and the province.

In order to remove the fish from the bottom of the pens, fish farm companies often contract the work to local diving companies to collect the fish and maintain and clean the nets on the farms.

Unfortunately, this work is dangerous, and on September 12<sup>th</sup>, 2007, Stewart Edward Wallis, a 19-year-old resident of Klemtu, a community located in the Kitasoo/Heiltsuk First Nation, drowned while working to remove dead salmon from a net pen at one of Marine Harvest's farm sites near the village.

That tragedy was not isolated. Two other diving related deaths were reported at Marine Harvest farms in 2007 – one in Chile and another in the Faroe Islands.

*Audio clip of Klemtu promotional video:* Klemtu. Hope to the Kitasoo/Heiltsuk First Nation people. This small coastal village is located on Swindle Island in the central coast of BC and only accessible by boat or by plane. Once home to a thriving fish cannery and commercial salmon fishery, Klemtu, like many other coastal villages has seen little economic opportunity. Today, employees from Marine Harvest Canada are taking the one and a half hour flight from Port Hardy to Klemtu to join the community in celebrating ten years of a successful business partnership between nation and Marine Harvest Canada. Today, both Marine Harvest Canada and Kitasoo Seafoods jointly farm and process over ten million pounds of salmon each year, shipping the fresh salmon to destinations in Canada and the United States. The farms, processing plant, and harvesting vessels employ nearly 60 people, and have reduced unemployment in the village from 90 percent down to around 40 percent.

*JS*: Those are segments from a short promotional video for Marine Harvest's partnership with the Kitasoo/Heiltsuk First Nation.

You're tuned in to Deconstructing Dinner, a syndicated weekly one-hour radio show and podcast produced at Kootenay Co-op Radio CJLY in Nelson, BC. I'm Jon Steinman.

To learn more about this show and our multi-part series on salmon farming, you can visit us on-line at deconstructingdinner.ca

Now we do have one last clip to explore from the fish farm tour. Here again is the BC Salmon Farmers Association's Paula Galloway, responding to a series of questions.

*Male voice 3:* How many staff would you have on this farm?

*PG*: This farm site has five people as the regular staff and they go shifts of two. So there would be basically two or three people on each shift.

*Female voice 2*: [inaudible question]

*PG*: Well they're in charge of making sure that the feed doesn't go through to the bottom. They're in charge of making sure that when they start off a day, before they start feeding, they'll actually come out here and they'll do environmentals. They'll find out what's happening with the fish and what's happening with the water that's in the pens. They'll

look at dissolved oxygens. They'll look at salinity, temperature and they'll also find out if there's any plankton in the water. So that's how they start off the day. If they find that there's a problem with dissolved oxygen or if they think that there's a possible harmful plankton in the water then that changes what they're able to do. They have to make sure that they don't put the fish into harm's way. So dissolved oxygen, as your fish are eating, and they're coming up to feed they are using it and they crowd together so if you don't have enough dissolved oxygen to begin with and then you crowd your fish when they're feeding and then lowering the oxygen further you could actually have fish start to suffocate just while they're feeding. So those are things that they have to make sure that, if there's a problem with that, then they're looking at that.

The same thing with plankton. Plankton can harm either through attaching and ripping up the gills (which then causes mucous build-up which can cause the fish to basically suffocate from the mucous they produce on their own gills) or by producing toxins. So if the fish are moving up the water column to feed and you had harmful bacteria in the water column obviously you can be moving them through and through the opportunity to be in contact with those plankton that ...

*JS*: Why the open net concept instead of the closed containment which we're going to be visiting?

*PG*: The reason for the open net is a couple of different things. Right now, at this point in time, with what technology exists, it is the only way that you can grow the amount of salmon that we have in BC. We don't have closed containment systems that would allow you to do that.

So they're just not available. There is closed containment. Well you were at a closed containment... you were at a hatchery, right. But in terms of doing the volumes that we have, it's just not available. The nice thing about this is it obviously creates the opportunity for utilizing what is part of the natural environment for the salmon and their growth. So you have the currents going through the water. Everything about it: it's a nice atmosphere for them to grow in.

The only thing I would worry about [in closed containment] for the long run, *still*, is other things: things like fish welfare for the fish because if you're growing in a closed containment system for a long period of time usually they're growing at higher densities. So it's just not as pristine or as nice an environment as it is in the net pen here. In terms of something that's on land, the footprint would be so big in terms of utilization of energy and everything else that it really isn't there for doing it. I think, myself, it would have to be something that's in the ocean but I'm not sure what that would be at this point in time.

This clip was also sent to Alexandra Morton of the Raincoast Research Society, and here's her response to the question of open-net cages versus closed-containment.

*AM*: Well, it's nice she's thinking about the fish and it's kind of a cute statement. But what the farmers are doing, is they have night lights on these farms that attract an enormous amount of plankton. And then fish. And then other predators. Plus, plus they are getting washed by the current. So they're using the natural environment to clean the

pens, oxygenate the pens, take away all the waste and, I would believe, feed them as well. There's a lot of things that are attracted to these farms and I've seen herring in them and caplin. I know black cod have gotten into the nets. Friends of mine have been on farms that are harvesting and there are huge amounts of herring in the pens. When I look at these fish in the pens they have enormous teeth. Atlantic salmon have larger teeth even than the Pacific salmon. It's extraordinary that after all these years of domestication they should keep those big teeth. So they're using our environment as a flush oxygenator to feed their pens. They're getting a free service. They're benefitting hugely. The reason they don't want to go to closed containment is because they don't want to deal with their own waste. And, you know, really, who does?

So if the governments here say, "Fine, you can just dump into our oceans" of course they're going to do that.

She mentioned the concern that in closed containment the fish would be too densely packed. Well, of course, they can control that. If they want to keep them more separate they could lower their density. So that is something that they are in control of.

*JS*: Also raised by Paula Galloway was the issue of animal welfare, and this too induced a response from Alexandra. While Paula seems to view animal welfare issues only on the surface, according to Alexandra, there is much more at play than just stocking density.

*AM*: Well, when I look at a salmon farm I see violation of some critical natural laws. Wild salmon are nomads. And biologically that's very expensive thing for a fish—to be able to move out of a river through the coastal areas out into the open pacific. The learning and the amount of energy required to do all of that is enormous so you know there is a good reason.

Now these farms make the fish stationary and they put them places where salmon are not supposed to stay. So they break all these laws and what will keep happening to these farmers is diseases will continually get in from the wild fish. So to say they're doing this out of concern for their livestock, I don't really get that. They're violating fundamental natural laws and as soon as you do that... nature works relentlessly to fix that. It cannot tolerate 500,000 to a million farmed salmon in one place. And so nature is going to constantly be throwing the pathogens at them. The predators are largely kept at bay, but the pathogens can get in and nature is going keep going to try to unlock this key and they will have to continually throw new drugs – it's basically escalating warfare with these pathogens. And, you know, we humans lose it again and again. Whether it's the boll weevil in the cotton or viruses in our own bodies.

*JS*: Of course such pathogen concerns have already hit the salmon farming industry hard. We learned last week about the deadly ISA virus that swept through Chilean fish farms in 2007/2008, and has since appeared in Scotland in early 2009. Between 2001 and 2003, British Columbian farms were hit hard by another virus known as IHN, which devastated farmed salmon populations.

But in the end, this animal welfare story with respect to caging animals that would otherwise not be caged is quite reminiscent of the controversy surrounding caged egglaying hens, as an example. As for confined poultry in general, well, during the same week that this broadcast goes to air, the Canadian Food Inspection Agency is preparing to kill 60,000 turkeys at an industrial turkey farm in Abbotsford, British Columbia. The reason? Avian influenza.

#### Soundbite

Now I too was rather perplexed by the animal welfare concerns posed by Paula Galloway of the BC Salmon Farmers Association, as it was only hours earlier that we had visited Marine Harvest's Big Tree Creek hatchery. As was discovered there, both unintentional and intentional killing of fish is standard at farmed salmon hatcheries.

Female Voice 3: Inside or outside of the tank?

JS: Do they sometimes jump outside the net?

*Female Voice 3:* Yes, if they find any little hole ... They're quite the jumpers these guys.

Grading is separating the fish, taking the larges off: the larges and mids. And then we're culling the very bottom of them. Which gives us a more consistent size because they'll be vaccinated fairly soon so we just want the biggest for ...(fades out).

(sounds of water and machinery are heard in the background)

Janet here is pumping fish from the tank down there where you can see the pump sitting, and the green sign. So they're getting pumped up to the top of the grader. The bars are set for the sizes we want. There's turning bars up there.

Female Voice 1: What's getting pumped up there, the fish?

*Female Voice 3*: The fish are getting pumped to the top of there.

*Female Voice 1*: Through here?

Female Voice 3: Through here. Yep.

And the very smallest – the ones that we don't want are coming off first, the culls. And then we have the other pipeline here is taking off the mids – so that's anything 25 grams and under, and then the largest are going into the tank off to the right here.

JS: And this is Deconstructing Dinner.

Now certainly this series on fish farming thus far has raised some fundamental questions regarding the role of the Province of British Columbia in regulating the presence of salmon farms along the BC coast.

Alexandra Morton or the Raincoast Research Society whom we've been hearing from throughout today's broadcast has been long opposed to the presence of open-net salmon farms.

While studying orca whales up until the 1990s, Alexandra watched as the salmon farming industry appeared in the Broughton Archipelago where she calls home and where she conducts her research. As she observed, the arrival of these industrial farms triggered fundamental ecological transitions. When 10,000 pages of letters to all levels of government failed to elicit meaningful response, Alexandra realized that she would have to scientifically prove that salmon farming had driven out the whales and caused epidemic outbreaks of bacteria, viral and parasitic infections in wild salmon. By partnering with international scientists and in some cases commercial fishermen, Alexandra has documented the loss of the whales, thousands of escaped farm salmon, lethal outbreaks of sea lice, and antibiotic resistance near salmon farms.

Alexandra is likely known by the Province and the salmon farming industry as "Enemy Number One", as it was her research that first sparked the intense debate regarding sea lice, and what level of impact, if any, salmon farms are having on wild salmon populations.

We'll be learning more about sea lice in much greater detail on our next installment of this Norway, British Columbia series. You can expect that in the coming weeks.

Now having fought so hard to see the presence of salmon farms disappear from the open ocean, the farms do remain, and Alexandra has since sought a unique and rather non-scientific approach: take the province and Marine Harvest Canada to BC Supreme Court and challenge the constitutionality of the province's regulating of open-net salmon farms. Under the newly formed Pacific Coast Wild Salmon Society alongside the Wilderness Tourism Association, the Southern Area (E) Gillnetters Association and the Fishing Vessel Owners' Association of British Columbia, this group of petitioners had their day in court in late September 2008.

The petitioners are represented by lawyer Gregory McDade and the judge presiding over the case has not yet issued a decision.

I sat down inside the Vancouver courtroom for the first two and a half days of the four day trial, and witnessed what Alexandra Morton called, a very "riveting" case that is challenging the province's jurisdiction over the regulating of fish farms.

I spoke with Alexandra outside the courthouse and she explained why this case is so riveting.

*AM*: I found it so riveting because I've been involved in this issue since 1989 and there has been study after study and report after report and government process after process many of which the environmental community have attributed to me, but to me they were just kind of a side view and I was always focused on the biology. But now when I pull back and get led through this regulatory maze by my lawyer I see how defenses were built for the province to be able to handle this issue and how the federal government abdicated and how important all these processes are now and what they said. And also, the one I love the most was the salmon aquaculture review. They picked six scientists to argue out the science and I'm one of them and one of the issues that the province had

with me in this case was standing: am I worthy witness? So that really, I think, cemented the validity of my standing.

*JS*: Alexandra describes what was being challenged in that courtroom on the day she spoke to me in Vancouver.

*AM*: What we're challenging is the provincial government's right to regulate and site fish farms because they exist in a federal jurisdiction, which is the ocean, we think they should be managed by the federal government. Furthermore, the big concern with the province is that they have absolutely no jurisdiction or concern or care being given to the wild fish and the federal government has that concern and responsibility. So while it wasn't my choice as to which level of government should have fish farms, the law says it's the federal government and there is very good reason for that.

*JS:* At the centre of this controversial question of who should be regulating fish farms, is what is called a Memorandum of Understanding (an MOU). This was a document that the Federal Government gave to the Province in 1988. As lawyer Gregory McDade put it, this MOU is not legally binding, raising a number of important questions.

*AM*: This MOU by the sounds of it gave responsibility of the fish farms to the provincial government based on the premise that there's no impact of aquaculture of the marine environment and I tell you, all through the 90s the ministers of fisheries would write to me the same sentence:"There is no impact of aquaculture or any component of the marine environment". And I always found that so outlandish because we don't even know what every component of the marine environment is. But for him to keep saying that I realize now he was buttressing this MOU. These were all documents that would solidify the provincial government's rule over fish farms. It also explained to me why no federal scientists now will agree to my science even though I'm being published in some of the most difficult journals in the world and as are my colleagues the DFO scientists can never agree. That's because as soon as they do this regulatory house of cards falls.

*JS*: A copy of this MOU is linked to from the Deconstructing Dinner website and the January 22, 2009 broadcast.

Now this case is certainly not an easy one to understand. I can admit that even sitting for two and a half days in the courtroom itself raised more questions for me than answers. Such is the case with legal proceedings.

What was most palatable though was the time that lawyer Gregory McDade spent seeking to prove just how interactive of a relationship salmon farms have with the marine ecosystem. It was hoped that by outlining all of those impacts, it would be made clear just how important it is that whoever is responsible for regulating the marine environment be the same regulator overseeing fish farms.

Today's broadcast has outlined a number of such interactions that clearly prove that there is indeed an interaction between the two (from fish feed, to feces, to pesticides, excess nutrients and cleaning solutions, there is much leaving these farms and entering the marine ecosystem), but of course, this is a legal case, and in order to drive home this

point, semantics took over much of the debate. For one, there was much discussion around what is defined as a "fishery". This word happens to be a pivotal piece in determining just who is legally and constitutionally responsible for regulating the industry. Does, for example, salmon aquaculture represent a "fishery"; and what about farmed fish when they escape; does the company raising them still own those fish? The defendants in the case made it clear that salmon farming is not a fishery and thereby should not fall under federal jurisdiction.

As an example of the arguments used in the case by Gregory McDade, when farmed fish do escape, the federal Department of Fisheries and Oceans (the DFO), issues a permit to catch the escaped salmon (similar to any permit issued for capture of wild salmon). And so it was questioned; if the fish do indeed belong to a salmon farming company, why would the company need a permit to recapture them?

Alexandra Morton shares her thoughts on this "fishery" debate.

*AM*: To me they are really one and the same because it's salmon in the marine environment that are being caught and processed for human consumption so it is a form of fishery but it also crosses the boundary into farm or feedlot so it's really a grey zone but I see it as a fishery.

*JS*: It is important to point out that the Province of British Columbia's Bill Harrower, whom we heard from earlier, did, on a few occasions during my salmon farm tour refer to salmon farms as a fishery. The province even goes so far as to call inspectors of fish farms "Fisheries Inspectors". Nevertheless the lawyer for the crown, representing the province insisted that fish farms do not constitute a fishery.

Yet another argument used by Morton's Lawyer Gregory McDade, was that of fish escapes. Located in section 3(1) of the province's aquaculture regulations is an important paragraph. The section reads this:

"A person must not release aquatic plants or fish, or cause, authorize or allow the release of aquatic plants or fish, to fresh or tidal waters from an aquaculture facility or from a containment structure or an attachment structure in an aquaculture facility unless authorized to do this by an aquaculture license (unless authorized to do this by an aquaculture license)".

Again, it says: "*unless authorized to do this by an aquaculture license*". According to Gregory McDade, this lays down the basis for the province to regulate escape of fish, thereby suggesting that the province is in a position to regulate what is happening in the open ocean – a role that the Federal Department of Fisheries and Oceans is supposed to maintain.

*AM*: Well funny you mention that because I tried to take the fish farmers to court under the federal fisheries act on exactly that section because under the federal fisheries act the definition of fish would include sea lice because it includes crustaceans and sea lice are a parasitic crustaceans and the fish farmers are, in my estimation, releasing lice in unnatural numbers from a place they wouldn't normally be. But I was not actually

allowed to go to court because a special prosecutor basically decided before the case that because the fish farmers didn't actually own the sea lice that they could not be guilty of releasing the sea lice.

The currents travel in six hours a particle can travel ten kilometers and then goes on and on and on and so the nets aren't holding anything. They don't even manage to hold the fish effectively. They are in the marine environment. They are affecting the marine environment: they're a fishery.

JS: And this is Deconstructing Dinner.

Now what likely stood out for me as one of the more interesting questions placed before the court, was the constitutional one. As outlined earlier on the show, the province has jurisdiction over the seafloor, yet through issuing fish farm licenses for the water column above the seafloor, this thereby is granting ownership of the water as well. This, as Gregory McDade suggested, is undermining the constitutional right of all Canadians to have open access to Canadian waters. As he suggested, the privatization of public ocean space endangers all of Canada.

McDade questioned if the Federal government ever gave the province the right to grant corporations private use of our ocean? Because the answer is argued to be no, the petitioners did invite the Federal government to join the case before it was filed, but they did not respond to the invitation.

Now what is likely the most palatable example of what this legal challenge represents and what it's seeking to change is the reason why the largest fish farming company was also challenged along with the province. This case is using one fish farm in particular as the test case,

*AM*: We had to pick one fish farm to take this action and so we've picked the Glacier Falls fish farms which belongs to Marine Harvest. I could have picked a mainstream farm but I picked Glacier Falls because in my estimation it's killing the Ahta River which is the most southern virgin watershed in British Columbia. I have an enormous amount of data on what the fish looked like before they reached the farm and after they reach the farm.

It's 650,000 fish. And it's located on a wild salmon migration route. In particular, a juvenile wild salmon migration route. It's in a dent in the coastline where the young fish go to rest and so fish will coalesce there in the hundreds and hundreds of thousands and spend a long period of time there and it's so sickening and distressing to watch the young fish get infected with lice. I can see them arrive, become infected, and leave in a state of dying.

Back in 1989 the Provincial government promised there would never be a fish farm there. [They] zoned as a Red Zone which meant they wouldn't even accept a fin fish aquaculture license and yet there's a farm here. So it's a test case farm and if we win this should, in theory, apply to all the farms in British Columbia and the provincial leases become invalid and unconstitutional but we needed a single farm. However that's not to say it's having the most impact of any fish farm in the BC coast. There are other fish farms that are as bad or worse. It was just the one I had the most data on.

*JS*: Links to more information including post-trial remarks about this case will be made available on the Deconstructing Dinner website.

When a decision is made regarding the case, we will of course be sure to bring that information to you as soon as possible.

In closing out my interview with Alexandra outside BC Supreme Court in Vancouver, I asked her if her interest to pursue this case was a sign that her efforts to use science since 1995 to challenge the presence of these fish farms had failed.

*AM*: Yes. The science has failed. That's an absolutely correct analysis. However it is an essential building block. Because without it the government just kept saying to me "Ms. Morton there is no evidence of: displacement of killer whales, toxic algae blooms, sea life impact". But when I really analyzed that sentence, I realized they said they had no evidence. And I realized what they needed was evidence and as a biologist I have the capability to provide that. And so ... Yes, it is very important. We wouldn't be at the point we're at now [without it]. I am disappointed that it wasn't enough because this is an incredibly expensive deviation in my life.

*JS*: Alexandra Morton of the Raincoast Research Society. Alexandra spoke to me in September 2008 while in Vancouver.

Before wrapping up the show, here are some last and important points regarding the role of the Province in regulating open-net fish farms: In October 2004, BC Auditor General Wayne Strelioff said this of the provincial government's role "Existing provincial legislation and regulations do not provide adequate protection for salmon habitat".

And In 2001, the Federal Auditor General released an internal audit, stating that the federal Department of Fisheries and Oceans is in a conflict of interest as they try to promote the expansion of salmon farming while being legally mandated to look after wild fish and fish habitat. The report read this "The Department is not fully meeting its legislative obligations under the Fisheries Act to protect wild Pacific salmon stocks and habitat from the effects of salmon farming."

Again, that's taken directly from a report of the Auditor General of Canada, February 2001.

## Soundbite

And that was this week's edition of Deconstructing Dinner produced and recorded at Nelson, British Columbia's Kootenay Co-op Radio. I've been your host Jon Steinman. I'd like to thank my technical assistant John Ryan. The theme music for Deconstructing Dinner is courtesy of Nelson area resident Adam Shake. Deconstructing Dinner is provided free of charge to campus community radio stations across the country and relies on the financial support from you the listener. Support for this program can be donated through our website at deconstructingdinner.ca or by dialing (250) 352-9600.