Subject: RE: Egg Imports
Date: Monday, December 20, 2010 3:57 PM
From: Richards, Laura <Laura.Richards@dfo-mpo.gc.ca>
To: Alexandra Morton <gorbuscha@gmail.com>
Cc: "Davis, Terry" <Terry.Davis@dfo-mpo.gc.ca>, "Thomson, Andrew" <Andrew.Thomson@dfo-mpo.gc.ca>
Conversation: Egg Imports

Dear Alexandra - I ask that you direct any further questions related to egg imports to Andew Thomson.

Best wishes for the holiday season.

Laura Richards
Dr. Laura Richards
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From: Alexandra Morton [mailto:gorbuscha@gmail.com]
Sent: December 11, 2010 7:51 AM
To: Richards, Laura
Cc: Brian Riddell; Hume, Mark
Subject: Egg Imports

Dr. Richards

The comment below from Pat Chamut suggests that you have left out a large number of Atlantic salmon imports in your email to me. The question is: how many Atlantic salmon eggs have come into BC and from where? Andrew Thomson could not answer this, so I suspect either you guys don't know, or you don't want to say. With a purported retrovirus that remains unidentified in the majority of Fraser sockeye that share water with millions of Atlantic salmon we need complete answers.

On December 3, 1990 Pat Chamut, then Director General DFO writes:

"*Continued large-scale introductions from areas of the world including Washington State, Scotland, Norway and even eastern Canada would eventually result in the introduction of exotic disease agents of which the potential impact on both cultured and wild salmonids in BC could be both biologically damaging to the resource and economically devastating to its user groups.*"

I note disease reporting under DFO management will be tailored to each site and knowing how shy the fish farmers are about revealing their diseases it is not hard to surmise diseases of concern will be dropped from reporting. The trouble is this is a tremendous threat to British Columbia. Fortunately, there is no law yet against those of us who are concerned from doing a study on Salmon Leukemia in wild fish populations.

Alexandra Morton

On 12/3/10 3:24 PM, "Richards, Laura" <Laura.Richards@dfo-mpo.gc.ca> wrote:

> Dear Alexandra,
>
> I would like to respond to your e-mail dated November 15, 2010, regarding causes of pre-spawn mortality of Fraser River sockeye.
>
> With respect to transfers of Atlantic salmon eggs into British Columbia, all introductions of eggs into BC are closely tracked by the federal-provincial Introductions and Transfers Committee which was created specifically to consider potential ecological, genetic and fish health risks associated with moving aquatic organisms into and within the province. Based on their records from1986 to present there have been no imports of eggs from Norway into British Columbia.
>
> From 1995–2001, all Atlantic salmon eggs imported into BC came from a land-based facility in Washington State. This importing company's broodstock program was developed from eggs that originated in the Gaspe' Region, Québec.
>
> For the period 2004-2009, all imports of Atlantic salmon eggs into British Columbia, have come from a single company in Iceland. Fish viral pathogens such as ISAV and IPNV have never been found in Iceland. In addition there are no reports of any clinical signs that might indicate the presence of other viruses in Icelandic Atlantic salmon stocks.
>
> There were no Atlantic salmon eggs imported into BC in 2002, 2003 and 2010.

As has been communicated to you previously, eggs are screened for all known viral agents prior to shipment to BC. For each import into BC the eggs and their resulting progeny are health screened 5 times prior to release to seawater. This screening is conducted by a third party laboratory using diagnostic methods as outline in the Fish Health Protection Regulations (FHPR). There has never been any viral pathogens identified during any of these screenings, nor have there been any physical signs that undiagnosed infectious agents were present. ISAV has never been found in farmed salmon populations in British Columbia.

Using the OIE-recognized diagnostic test for ISAV we have also conducted some screening of wild Pacific salmon and trout for the presence of this virus. This includes hatchery-reared rainbow trout and coho salmon that are routinely screened as part of the FHPR Certification Program. In 2009, 100 sockeye salmon smolts collected from the Strait of Georgia and Johnstone Strait were screened for the presence of ISAV. None of these fish tested positive for ISAV.

With respect to cardiomyopathy syndrome (CMS) of Atlantic salmon there has never been any report of signs of this syndrome in British Columbia. As you have reported in your Salmon Virus Watch Postings "the signs of this syndrome are obvious" so if CMS was present in BC it would not have gone un-noticed. Cardiac deformities that have been reported in BC farmed Atlantic salmon do not match those seen in Atlantic salmon suffering from CMS. This was noted by the two veterinarians who were authors of the report (Brocklebank and Raverty, 2002, CANADIAN VETERINARY JOURNAL43: 129-130).

With respect to Kristi Miller's presentation at the June 2010 PSC workshop, research is ongoing. I intend to give my evidence on this topic before the Cohen Commission rather than through an e-mail exchange.

Laura

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From: Alexandra Morton [mailto:gorbuscha@gmail.com]
Sent: November 15, 2010 9:41 AM
To: Richards, Laura
Cc: Lapointe, Mike; Brian Riddell; Johnson, Stewart; Farlinger, Susan; Saunders, Mark; Marvin Rosenau; Rick Routledge; Larry Dill; Patricia Gallaugher
Subject: Re: High pre-spawn mortality

Dear Laura

Thank you for this detailed reply. Just for the record there is a mistake in the dates below, "December" must be meant to read "November." In discussions with scientists last winter at the various sockeye meetings I attended I think it would be fair to say that 10% PSM has become rare in the past decade. PSM is actually quite a much higher in Fraser sockeye stocks 38 – 100% (Lapointe et al 2003).

My experience in the Broughton Archipelago with sea lice and the rather extreme DFO denial that has gone on around that, and the Minister's unreasonably cavalier attitude around ISA, which is not shared by the scientists publishing on ISA transmission, has led me to suspect the impact of salmon feedlots on wild salmon could be far greater than your agency has been allowed to protect us against. Your suggestion that Fraser sockeye PSM is 10% in your recent letter is exasperating, because we all know it is much much higher.

There have to be some better answers. Please explain DFO's assessment of the potential role of three salmon feedlot viruses on prespawn mortality and population of Fraser sockeye stocks:

Infectious Salmon Anemia which your minister refuses beyond reason to accept can travel in Atlantic salmon eggs and thus threatens the North Pacific with its introduction.

Cardiomyopathy syndrome (CMS) *just identified* in Norway even though it has been widespread for 10 years. Eggs coming into BC cannot have been tested for this over the past decade.

The virus Kristi Miller presented at the PSC June 2010 and is referred to in the memorandum released by the Globe and Mail last week that your

name appears on. This memorandum is at odds on several points in the Miller presentation. She called it "novel," not *endemic* and did not suggest it was "widespread." Miller noted that the virus appears in smolts, but unlike this memorandum, she did not excuse aquaculture in her presentation. She interpreted the presence of this virus in smolts as evidence of vertical transmission, not freshwater transmission. Miller made the finding of this "unhealthy" signature in 2006 not 2009.

I was really disappointed with Paul Sprout publishing a letter in a newspapers on Sept 1 2009, stating fish farms were not responsible for the 2009 sockeye crash because the Skeena sockeye return was also low. The difference between Skeena and Fraser was orders of magnitude and we all know sockeye that pass salmon feedlots mingle with Skeena stocks. To dismiss aquaculture before any review of the crash had been possible was remarkable. Miller noted in her PSC presentation that the unhealthy signature of this virus is "strongly associated with diversion of fish through Johnstone Strait." Was Sprout as RDG of BC not aware of this or hiding it? When a "novel" virus suddenly appears in the sockeye passing 70 salmon feedlots, full of salmon from an ocean full of viruses "novel" to the Pacific the public agency in charge of wild salmon healthy should not dismiss the industry in the first few days after the collapse goes public.

Please let me know:

- How DFO is certain the extremely high prespawn mortality reported by Lapointe and 2009 sockeye crash has not been aggravated by the Miller Virus, ISA or CMS?
- Have you identified the Miller virus?
- Have you traced every shipment of eggs into BC to find out if it was from a stock associated with CMS or ISA in Norway? I understand BC has only received eggs from Iceland recently (pers. com Riddell), but does that go back 10 years?
- Do you know if the Miller is not a human health threat? Retroviruses seem pretty dangerous.
- Have you approached Norwegian virologists in your pursuit to identify the Miller virus?

Thank you for your consideration,

Alexandra Morton

On 11/10/10 4:19 PM, "Richards, Laura" <Laura.Richards@dfo-mpo.gc.ca> wrote:

Dear Alexandra

I would like to respond to your e-mails dated November 2, 2010, and December 7, 2010, regarding reports of extremely high pre-spawn mortality of sockeye in the Lower Shuswap and Adams Rivers.

Before commenting on the Department of Fisheries and Oceans (DFO) monitoring and assessment activities, it's important to distinguish between the two categories of mortality experienced by sockeye along their migration path and (DFO) programs to assess each. Pre-spawning mortality (PSM) is defined as female sockeye mortality that occurs within a spawning population that have successfully migrated to their spawning grounds but which die prior to completion of spawning. En-route mortality (ERM) refers to mortality occurring within the freshwater riverine environment that is not attributable to direct fishery related removals or to PSM.

DFO annually monitors all major Fraser River sockeye salmon populations to determine spawner abundance and spawning success. During spawner enumeration surveys, an estimate of spawning success is generated for each spawning site based on female carcass assessment. As PSM is expressed as the percentage of the total estimated female spawning population that did not successfully spawn, these values cannot be calculated with any level of accuracy until spawning is complete and spawning estimates are available. Assessment programs are ongoing and it will be several weeks before spawning estimates become available.

This year field staff reported high numbers of unspawned moribund females during the early and middle portions of the Lower Shuswap River Sockeye run. However, at this time it is

impossible to put these observations into context as PSM is typically higher on the early to mid portion of the run. PSM in the range of 10% is not uncommon for Fraser sockeye and given the magnitude of the return experienced this fall, even normal levels of PSM could potentially represent a large number of observed carcasses.

Estimates of en-route mortality (ERM) are difficult to obtain due to the size and water conditions of the Fraser River. En-route mortality has been periodically assessed for some Fraser sockeye stocks via the application of acoustic or radio tags and tracking the progress of tagged fish along their migratory route. Estimates of ERM are limited by the number of fish that can be tagged and at a spatial scale by the number of receivers along the Fraser River. In 2010, DFO in partnership with other researchers, applied acoustic tags to sockeye in both marine approach areas and in the lower river to obtain estimates of ERM. Given that assessment is ongoing, it is too early to report on en-route mortality levels for 2010.

Tissue biopsies were also collected from the radio-tagged fish for microarray analysis. Additional samples (RNA, tissue, blood, gill, brains, and tissues for histology) were collected from returning adults in Johnstone Strait, the lower river and on the spawning grounds. Samples collected in 2010 have not been processed yet.

DFO's Environmental Watch Program, in collaboration with other internal and external researchers, is investigating the impact of different environmental factors on the migration success of Pacific salmon in fresh water. Annual activities include biological, energetic, physiological, and disease assessments of migrating and spawning adult Fraser sockeye salmon. In 2010, all major stocks were assessed, but effort focused on late run sockeye behaviour and consequences (e.g. ERM and PSM) for the development of descriptive and predictive modeling for fisheries management.

In addition, DFO's Aquatic Animal Health section has been monitoring Fraser Sockeye salmon populations at Nadina River and Weaver Creek for the presence of pathogens and disease annually since 1986. In early September 2010, samples of moribund sockeye salmon from Nadina River spawning channel tested negative for viral pathogens (OIE methodology) and tested

positive for the presence of *Aeromonas hydrophila,* a bacterium ubiquitous in the Fraser River and common in spawning sockeye. This bacterium is normally considered to be of low virulence, but can be a problem in fish that have a compromised immune system. Samples of tissues submitted for histology have not yet been analyzed. Sockeye sampled from Nadina River in late September tested positive for infectious hematopoietic necrosis virus (IHNV). IHNV has been reported in post-spawned fish in the Nadina River sporadically since 1986. There is no evidence that IHNV has an effect on pre-spawn mortality rates. The analyses of 2010 samples are ongoing with an expected completion date of spring 2011.

As you can gather, DFO has a significant program of monitoring and analyses underway related to determining the levels of pre-spawn mortality and its potential causes.

Thank you for writing to me with your concerns.

Sincerely,

Laura Richards

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From: Alexandra Morton [mailto:gorbuscha@gmail.com]
Sent: November 2, 2010 8:52 AM

To: Richards, Laura; Johnson, Stewart; Saunders, Mark; Farlinger, Susan
Cc: Lapointe, Mike; Brian Riddell
Subject: High pre-spawn mortality

Dear Laura Richards,

Many people are writing to me about extremely high pre-spawn mortality in the lower Shuswap and the Adams Rivers.

Can you pass on to me what DFO is doing in response to this so I can inform them? Given Kristi Miller's work suggesting a novel virus is seriously impacting, perhaps even killing, the majority both adult and juvenile Fraser stock sockeye it would seem very important to do comprehensive pathology on this event.

People are writing me because they claim they never get answers from DFO.

Thank you very much,

Alexandra Morton