

**COHEN COMMISSION OF INQUIRY INTO
THE DECLINE OF SOCKEYE SALMON INTO
THE FRASER RIVER**

**SUPPLEMENTARY FINAL WRITTEN
SUBMISSION**

**Prepared on behalf of Area D Salmon Gillnet Association and
Area B Harvest Committee (Seiners)**

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1. The potentially devastating impact of ISAv on wild salmon

Infectious Salmon Anemia Virus (ISAv) is a virus that infects farmed Atlantic salmon and can be subsequently transmitted to various species of wild fish.¹ ISAv outbreaks have been repeatedly documented in areas where fish farming is prevalent and has had devastating consequences on fisheries in various countries, including Norway, Eastern Canada, USA, Ireland, Scotland, Faroe Islands and Chile.² Given the international evidence demonstrating the extreme risk of ISAv in areas where open-net aquaculture is occurring and the significant expansion of fish farming on the coast of British Columbia over the past 30 years, there is a high potential that an ISAv outbreak could occur in Pacific salmon. The re-opening of the hearings of the Cohen Commission of Inquiry (the “Cohen Commission”) to address the possible presence of ISAv in Pacific salmon speaks to the importance of this issue to the health of wild salmon on the coast of British Columbia, and particularly Fraser River sockeye.

The Cohen Commission held three days of hearings to examine the positive ISAv results from recent testing of Pacific salmon from BC waters (the “ISAv Hearings”). In these Supplementary Final Submissions (“Supplementary Submissions”), we highlight key evidence from the ISAv Hearings, and provide additional recommendations for the Commissioner’s consideration in drafting his final report.

¹ Hearing Transcript (December 15, 2011), p. 9-10, l. 4 – 10.

² Exhibit #1502, Vike, Nylund & Nylund “ISA Virus in Chile: Evidence of Vertical Transmission”, Nov 26 2008 [Archives of Virology] at p. 1

2. Implications of an ISA or an ISA-like virus in British Columbia

The testing of Pacific salmon by Dr. Fred Kibenge (Chairman, Department of Pathology and Microbiology, Atlantic Veterinary College, University of PEI), Dr. Are Nylund (Professor, University of Bergen, Norway) and Dr. Kristi Miller (Head Molecular Genetics, DFO, Nanaimo) throughout the fall of 2011 provides strong evidence that an ISA or ISA-like virus is present in BC salmon. Further, according to the evidence of the Government's own expert scientist Dr. Miller, the presence of ISAV is negatively impacting the health of wild salmon on the BC coast.³

Dr. Miller's recent PCR testing of various distinct datasets of BC salmon has resulted in a series of positive ISAV results. In her testimony, Dr. Miller described positive results from datasets of farmed salmon samples, wild sockeye salmon samples (from her archives dating back as far as 1986) as well as chinook, pink and Harrison river salmon. During her direct examination by Commission counsel, Dr. Miller described positive ISAV results from samples from a number of species of Pacific salmon:

31 DR. MILLER: Yes. And actually, there was a subset of
32 pink salmon in this as well, and we did observe
33 them in pink salmon as well.

34 Q In addition, has there been other testing of other
35 species of Pacific salmon that you've done
36 recently?

...

45 ... It's all Chinook salmon.

46 And so I went ahead and ran their fish
47 through the battery of different pathogen on the
1 Fluidigm that we've been employing for our wild
2 fish, and we did identify some positive ISA fish
3 among their fish. I should say these are fish
4 that were sampled in the wintertime last winter.
5 I believe that they were close to market-size
6 fish. And the CT values were very similar to what
7 we see in out-migrating sockeye salmon, as were
8 the prevalence levels of positives.

...

14 ...we basically picked up a similar prevalence
15 level and CT values that we see in wild migrating
16 sockeye.⁴

³ Hearing Transcript (December 15, 2011), p. 50, l. 26 – 34.

⁴ Hearing Transcript (December 15, 2011), p. 52, l. 31 – 47; p. 53, l. 1 – 14.

Dr. Miller explained that she found ISAv in Harrison salmon samples from 2008:

12 DR. MILLER: In comparison to other years, including
 13 '08s. '08s, there was -- in '08, I believe, if
 14 I'm correct, that -- I don't have the data in
 15 front of me right now, but that there were a fair
 16 number of Harrison fish that were positive in the
 17 fall for ISA, as well.⁵

In an email to several colleagues, Dr. Miller says, “We have a substantial number of PCR positives from the late 1980's, suggesting that what we are picking up has been in BC for at least 25 years.”⁶ She concludes:

26 DR. MILLER: Just to conclude, what this approach tells
 27 us is that these fish are...
 28 responding to the presence of this virus. This
 29 doesn't necessarily mean that we've demonstrated
 30 that there's disease and mortality, but we have
 31 demonstrated that it's not doing nothing. There
 32 is some level of damage that is occurring to the
 33 host, even at these high CT values that we're
 34 seeing in these wild fish.⁷

In terms of the consequences of ISAv in BC salmon, Dr. Miller acknowledged the seriousness of the situation with ISA: “... if ISA have a virulence that they see in Norway were to come here and be virulent in our wild salmon, that would be a disaster.”⁸

Dr. Kibenge provided very sound and reliable expert evidence on ISAv and his recent detection and identification of this virus in samples of sockeye salmon. His expertise is evident given his extensive qualifications, including his OIE World Organization for Animal Health {“OIE”} designation as an ISA expert.⁹ The Atlantic Veterinary College is one of two labs in the world that is an OIE designated Reference Lab on ISAv.¹⁰ He testified that RT-PCR testing performed on 48 sockeye salmon samples provided to him by Dr. Richard Routledge (Professor of Statistics, Simon Fraser University) resulted in the two positive ISAv results (in samples #26 and

⁵ Hearing Transcript (December 15, 2011), p. 114, l. 12 – 17.

⁶ Exhibit #2055, Email from K. Miller-Saunders to S. Stephen, More results for orthomyxo primers - Jan 1, 2001

⁷ Hearing Transcript (December 15, 2011), p. 50, l. 26 – 34.

⁸ Hearing Transcript (December 15, 2011), p. 128, l. 39 – 42.

⁹ Hearing Transcript (December 15, 2011), p. 74, l. 39 - 40.

¹⁰ Hearing Transcript (December 15, 2011), p. 74, l. 38, 46-47.

#36).¹¹ Dr. Nylund, an international expert on ISAv, also performed RT-PCR testing on the 48 sockeye samples sent by Dr. Routledge and found sample #36 was positive for ISAv.¹²

When asked by Mr. McDade, counsel for the Aquaculture Coalition, what the likelihood is of finding a false positive in the same fish when tested by two different labs, Dr. Nylund responded as follows:

40 ... I would say
 41 the chances are very small, to tell the truth,
 ...
 3 ... I think
 4 that Kibenge's results on this are correct.
 5 Unfortunately the material I looked at were
 6 so degenerated and so destroyed that it was
 7 impossible to reproduce any results at all, but we
 8 got one positive. But I -- since it's only one we
 9 -- positive and it was not possible to repeat, I
 10 wouldn't put too much into that. But **I think that**
 11 **Kibenge's results are reliable...** [emphasis added]¹³

Dr. Nylund noted that the PCR testing methods that Dr. Kibenge employed would be much more likely to generate a false negative than a false positive result.¹⁴

Recommendation:

This evidence of ISAv in BC salmon is extremely concerning as an ISAv outbreak could have catastrophic consequences to BC's wild salmon. The evidence of Drs. Miller, Kibenge and Nylund provides a very strong foundation for the immediate removal of fish farms from sockeye salmon migration routes, and immediate relocation of these farms to areas where contact with wild salmon populations is avoided. Further, as we stated in our Initial Final Submissions dated October 17, 2011 ("Initial Final Submission"), all future siting decisions should recognize that pathogens, and particularly ISAv, from fish farms present a risk to wild salmon populations.

¹¹ Hearing Transcript (December 15, 2011), p. 12, l. 38 - 41.

¹² Hearing Transcript (December 15, 2011), p. 115, l. 29-35.

¹³ Hearing Transcript (December 15, 2011), p. 115, l. 40-41; p. 116, l. 3 - 11.

¹⁴ Hearing Transcript (December 15, 2011), p. 68, l. 32 - 38.

3. Deception by DFO and CFIA regarding positive ISAv results

One of the most troubling facts that came to light during the ISAv Hearings were the actions taken by DFO and CFIA in an effort to convince the public that there is no ISAv in BC salmon. Rather than acting in the public interest and taking steps to protect the health of wild salmon (for example, providing accurate information to the public, immediate widespread testing, closing infected fish farms, etc), it became clear that, upon receiving Dr. Kibenge's report about his positive ISAv results, the Government's primary response was to attempt to raise questions in the public's mind about the testing and results. Specifically, DFO and CFIA emails and media releases demonstrate that their apparent goal was to win what they saw as a public relations battle, instead of working collaboratively with scientists to identify a possible aquaculture attributable viral infection among Pacific salmon.

In fact, the evidence demonstrates how DFO and CFIA engaged in a propaganda war, where they manipulated the truth to avoid alerting the public and the international community to the fact that an ISAv or ISAv-like virus had been detected on the coast of BC. One key example of how DFO misrepresents the reality of the situation can be found in Ms. Nellie Gagné's (Molecular Biology Scientist and Laboratory Supervisor, DFO, Moncton) testimony when asked by Commission counsel about the results set out in Exhibit #2038 "Technical Information for DFO Moncton" which provides a summary of the ISAv test results from that DFO lab.¹⁵ Ms Gagné responded, "they are negative."¹⁶ Commission counsel then took her to the document and she admitted that the results were not "negative" but were, in fact, "inconclusive."

6 Q What are the RT-PCR result reports in this
7 document?

8 MS. GAGNÉ: They are negative.

9 Q At the bottom of the document there's a row which
10 has -- it's greyed out or highlighted, I suppose,
11 "Interpretation of DFO testing" is the heading,
12 and then we see "inconclusive" or not applicable,
13 depending. Were your RT-PCR results inconclusive?

14 MS. GAGNÉ: We reported them as inconclusive based on
15 our policy...

21 ... in the case of negative results,
22 because of the possible degradation of any
23 material in there, we have to declare the samples
24 inconclusive.¹⁷

¹⁵ Exhibit #2038, Technical Information for DFO Moncton, based on Sample Sets for Lab Assessment Regarding ISA in BC Salmon, undated

¹⁶ Hearing Transcript (December 15, 2011), p. 16, l. 8.

¹⁷ Hearing Transcript (December 15, 2011), p. 16, l. 6 – 24.

In fact, Ms. Gagné confirmed that the testing of the Routledge samples at the Gulf Fisheries Centre in Moncton (“GFC Moncton”) found positive test result for ISAv in sample #38.¹⁸ Ms. Gagné’s lab could not repeat this result and so it was deemed a “weak positive” and rejected.¹⁹

The Government’s efforts to cover up and discredit Dr. Kibenge’s positive ISAv results and to mischaracterize DFO’s *inconclusive* results as *negative* are evident throughout their press releases and media statements. For example, Exhibit #2089 is a Statement from Minister Ashfield (Federal Minister of Fisheries and Oceans) and Don McRae (British Columbia Minister of Agriculture) with the headline “new test results indicating that there are no confirmed cases of ISA in British Columbia Salmon.” In this press release, Minister Ashfield is quoted as follows,

It has been a difficult few weeks for the fishing industry in British Columbia, and across the country, while waiting for these preliminary test results to come back. Because some have chosen to draw conclusions based on unconfirmed information, this has resulted in British Columbia’s fishing industry and Canada’s reputation being put at risk needlessly.

Minister McRae followed with this statement: “Reckless allegations based on incomplete science can be devastating to these communities and unfair to the families that make a living from the sea.”²⁰

Another example can be found in Exhibit #2021, a CFIA press release, which misstates the reality of the test results from GFC Moncton which were *inconclusive*, as opposed to being *negative* as they are described in the following excerpt,

“DFO has tested all 48 samples received as part of the original reports and the results are all negative for the virus. These results are consistent with the findings of an independent laboratory in Norway, which also tested samples associated with this investigation and provided a report to the CFIA.”²¹

As we know, the “independent laboratory in Norway” is Dr. Nylund’s lab, which in fact repeated one of Dr. Kibenge’s positive ISA results. Dr. Kibenge and Dr. Miller discussed another glaring example of this type of manipulation during their cross-examination by Ms. Reeves, counsel for

¹⁸ Hearing Transcript (December 16, 2011), p. 21, l. 43 – 44.

¹⁹ Hearing Transcript (December 16, 2011), p. 21, l. 43 - 47; p. 22, l. 30-33.

²⁰ Exhibit #2089, Press Release - Statement from the Minister of DFO and BC Minister of Agriculture, on New Test Results Indicating that there are No Confirmed Cases of ISA in BC Salmon - Nov 9 2011

²¹ Exhibit #2021, No Confirmed Cases of Infectious Salmon Anaemia in BC - Nov. 9, 2011

the First Nations Coalition. Ms. Reeves asked these scientists to comment on a statement from the Federal Minister of Fisheries and Oceans:²²

34 Q ... I'd like to move now to Exhibit
35 2004. This was a statement from the federal
36 Ministry of Fisheries and Oceans Canada, and in
37 the middle of this statement -- I'll maybe just
38 read it out:

...

40 After Canada's reputation has needlessly been
41 put at risk over the past several week[s]
42 because of speculation and unfounded science,
43 additional in-depth, conclusive tests, using
44 proper and internationally recognized
45 procedures, are now complete and we can
46 confirm that there has never been a confirmed
47 case of ISA in BC salmon, wild or farmed.

...

7 DR. KIBENGE: Sorry. Yes, I'm aware of this statement
8 and I've read it several times. My thinking here
9 is that I don't feel it was directed to my work,
10 because I -- this is not the way I see what we do.

...

16 Q Dr. Miller, do you have any thoughts about this
17 statement?

18 DR. MILLER: Well, if you notice, **it says "no confirmed**
19 **case of ISA", not ISAV. So again, it could be a**
20 **play on words here.** There's no confirmed case of
21 ISA as a disease in B.C. and I would say that
22 that's still true. But if one were to read it as
23 ISA virus, it may not be completely accurate.

24 Q Thank you. Did you feel that this statement was a
25 criticism at all towards your work that you had
26 been doing?

27 DR. MILLER: I guess the short answer would be yes, but
28 I was a bit surprised when I saw this. [emphasis added]²³

An email from Joseph Beres (Inspection Manager, CFIA) provides further evidence of how DFO and CFIA were strategizing to win what they saw as a public relations war. In his email to seven DFO and CFIA colleagues, Mr. Beres states:

²² Exhibit #2004, Statement - Federal Minister of Fisheries and Oceans Canada - Dec. 2, 2011

²³ Hearing Transcript (December 15, 2011), p. 131, l. 34 - 47; p. 132, l. 7 - 28.

It is clear that we are turning the PR tide to our favour,- and this is because of the very successful performance of our spokes[persons]... you, Stephen, Peter and Paul were a terrific team, indeed. Congratulations!

One battle is won, now we have to nail the surveillance piece, and we will win the war also.²⁴

One of the recipients of Mr. Beres' email was Dr. Kim Klotins (Acting National Manager, Disease Control Contingency Planning, Aquatic Animal Health Division, CFIA). Commission counsel, during direct examination of Dr. Klotins, indicated that there might be a public perception that the federal government is treating this situation as a game, as opposed to seeking the truth.

23 Q I wonder if it suggests that there's sort of an --
24 that instead of this being a collective enterprise
25 where people are trying to learn the truth of a
26 situation --

27 DR. KLOTINS: Yeah.

28 Q -- this is a hockey game and we're wearing red
29 jerseys and we want to score on the other goal.
30 Is it an adversarial thing? Is the CFIA going
31 into this out of a concern for trade partners and
32 other interests with a view to, however we get
33 there, to announcing there is no ISAV?

34 DR. KLOTINS: Well, I don't read that in the e-mail,
35 because in surveillance you can get both results,
36 you can get positive results and you can get
37 negative results, so I don't -- my read is not
38 that there's a particular viewpoint that we're
39 following. I mean, the point of surveillance is
40 to find out if it is there or it is not there.

41 Q Mr. Stephen, I'd like to ask if DFO -- if you
42 could again address any appearance that DFO, in
43 the course of the testing work that goes on, has
44 gone into this with a view to looking to get to
45 the conclusion that there is no ISA or ISAV?

46 MR. STEPHEN: No, we have not. I can tell you that...²⁵

The evidence of the Government's efforts to cover-up and discredit Dr. Kibenge's test results is shocking and demonstrates that the Government is not acting in the best interests of the public or wild salmon. Canadians should be able to trust Government, and DFO in particular, to carry

²⁴ Exhibit #2110, Email from J Beres to C Kiley et al, re Fwd - The Early Bird - Nov 9 2011. ISAV, Nov 9 2011

²⁵ Hearing Transcript (December 16, 2011), p. 112, l. 23-46.

out its duty to protect wild salmon from aquaculture-associated pathogens and ensure healthy aquatic ecosystems. The ISAv Hearings have made it abundantly clear that Government agencies charged with protecting Pacific salmon have been prioritizing the interest of the aquaculture industry. We submit that Government has not been acting in the public interest and, instead, appears to be determined to convince the public that there is no ISAv on BC's coast, regardless of strong evidence to the contrary.

Recommendation:

The evidence regarding DFO's attempts to treat the ISAv matter as a public relations war illustrates the importance of refocusing the Department on its conservation mandate. We reiterate our recommendation that DFO should no longer be involved in aquaculture industry promotion, liaison or public affairs regarding aquaculture related matters. This conflict of interest is clearly compromising the Department's crucial mandate to protect wild salmon.

We also recommend the creation of an independent panel of experts that oversee the operations of DFO and CFIA, particularly in regards to monitoring of pathogens in wild and farmed salmon, and reports semi-annually to the Canadian public and Government through the filing of a report to Parliament and to the Auditor General of Canada.

4. Government's attack on scientists and their research into ISAv

In addition to misrepresenting the recent ISAv test results and the overall science demonstrating the significant risk to Pacific salmon posed by the aquaculture industry, the evidence strongly suggests that DFO continues to silence their own scientists from sharing results related to pathogens in BC salmon and salmon farms. Consistent with her prior testimony on August 24 and 25, 2011, Dr. Miller testified during the ISAv Hearings that she continues to be silenced by her superiors and, at times, intimidated by her senior-level colleagues. When asked by Mr. McDade whether Mr. Stephen Stephen (Director, Biotechnology and Aquatic Animal Health Sciences Branch, DFO) told Dr. Miller to not talk about ISAv, she responded,

35 DR. MILLER: That I was not to talk? Well, I mean, I'm
 36 not really supposed to be talking publicly about
 37 much of this, anyway, but I don't recall a
 38 specific statement, you know, not to discuss ISA,
 39 but I think it's a given that I don't go and speak
 40 publicly about this.
 41 Q You're under restrictions from speaking publicly

42 about this?

43 DR. MILLER: Well, I don't think anyone in DFO is
44 speaking publicly about this at the time.²⁶

Dr. Miller described how she alerted senior DFO managers about her positive ISAv results and that she was isolated within DFO throughout that time:

21 Q Let me ask you more generally, as a result of
22 these findings of ISA, have you felt any pressure
23 or adverse reaction from your other superiors?
24 DR. MILLER: I'm pretty alienated in the department at
25 the moment so the end result of all of this is I'm
26 not included in any conversations about any of
27 this so once I reported this information on the
28 24th, nobody in the department talked to me about
29 disease or ISA after that.²⁷

Dr. Miller explained further:

36 Q ... as of the 24th, senior people in DFO were
37 aware that the Pacific Biological Station in
38 Nanaimo was finding ISA?
39 DR. MILLER: By the 24th, they were aware of my work,
40 yes.
41 Q And so when statements were coming out from DFO
42 after November 24th, and in particular, the
43 statement from the Minister on December 2nd,
44 saying they were not aware of any ISA, that would
45 have been a surprise to you, wasn't it?
46 DR. MILLER: Yes, it was, but nobody was speaking to me
47 at that point.²⁸

During our cross examination of Dr. Miller, she described the intimidation that she experienced and the message she received from DFO management that "research should not fog policy."

9 Q Would you not agree with me that some of your
10 superiors would be unhappy that positive results
11 would lead to an internationally bad reputation
12 for Canada?
13 DR. MILLER: Oh, I think that there's some underlying

²⁶ Hearing Transcript (December 15, 2011), p. 107, l.

²⁷ Hearing Transcript (December 15, 2011), p. 109, l. 21 – 29.

²⁸ Hearing Transcript (December 15, 2011), p. 110, l. 36 – 47.

14 issues with that, yes.

...

31 DR. MILLER: Just to understand this, specifically what
32 he talked to me about was that there was a policy
33 in place about ISA that was developed between DFO
34 and CFIA. Policy cannot be a moving target, so
35 research could come up with new results of new
36 orthomyxoviruses, but that the sentiment that I
37 got was that research should not fog policy, so --
38 but my take, as a scientist, is that research
39 should inform policy, and if policy has to change
40 based on new findings, then that's what it has to
41 do. But I don't come from a manager's standpoint,
42 I come from a scientist's standpoint.

43 Q Did you interpret his comments to you in any way
44 that he was attempting to intimidate you, Dr.
45 Miller?

46 DR. MILLER: I personally took a level of intimidation
47 at the idea of my samples perhaps being taken
1 away. I don't know that he meant -- you know, I
2 mean, it was said to me by a number of different
3 individuals over again, and of course I did read
4 about what happened to Rick Routledge's samples in
5 his freezer in his graduate students' program when
6 CFIA took away all those samples and they weren't
7 able to continue with the research that they were
8 doing.

9 Of course, I look at my own program and I
10 think I have a lot to lose here if CFIA decided to
11 sweep in and take all my samples. I've got
12 thousands of samples and a very big program in
13 jeopardy, so whether Stephen Stephens (sic) meant
14 that or not, I certainly have been very concerned
15 about that.²⁹

Dr. Miller also reported a pattern of behaviour by her supervisors who were discouraging her from conducting research that might identify ISAv:

16 Q Did he say anything in terms of how positive
17 findings might be consequential in terms of our
18 relations with the Americans?

19 DR. MILLER: I think he just intimated that I, as a

²⁹ Hearing Transcript (December 15, 2011), p. 126, l. 9 – 47; p. 127, l. 1 – 15.

20 scientist, would not understand the complexities
 21 of these issues and that, as a scientist, I should
 22 not be undertaking research on something if I
 23 didn't understand the ramifications of what the
 24 results could do.
 25 Q And you took that as being intimidation, did you
 26 not?
 27 DR. MILLER: Some level of intimidation. [emphasis added]³⁰

One wonders whether the isolation and intimidation that Dr. Miller has experienced results from what she describes as her particular “philosophical approach” to her research:

15 DR. MILLER: I think you've picked up on a very
 16 important philosophical approach, and the
 17 difference between what my lab does and what
 18 people studying fish health do. At least, again,
 19 this is my view.
 20 Their approach is to make sure it's not
 21 there. My approach is to ask if there's any way
 22 that it is there. So I might take a different
 23 approach to it than they would on that basis.³¹

Even Dr. Kibenge described feeling attacked as a result of his recent testing for ISAv:

12 Q As a result of your making a simple scientific
 13 finding of ISA virus, you've been really quite
 14 attacked haven't you since then?
 15 DR. KIBENGE: Well, yeah, I would say that, but I can't
 16 understand where the government is coming from. I
 17 mean, that's my view.
 18 Q There's a lot of pressure been put on you and your
 19 university about this, hasn't there?
 20 DR. KIBENGE: Yes.
 21 Q And I'm going to give you a chance to say what you
 22 want to say about that, if there's anything you'd
 23 like to say.
 24 DR. KIBENGE: Well, I think we -- there has been a lot
 25 of information that has been out there, and it
 26 hasn't been easy. But I believe that I'm very
 27 fortunate that I'm at a university that is very

³⁰ Hearing Transcript (December 15, 2011), p. 127, l. 16 – 27.

³¹ Hearing Transcript (December 15, 2011), p. 140, l. 15-23

28 supportive. My dean in the vet school has been
29 very supportive and I think because of that
30 support we've been able to sort of deal with the
31 other issues that have come our way. I really
32 appreciate that support of the university and the
33 vet college in this matter.
34 MR. McDADE: I'm going to speculate that if you'd made
35 a negative finding, you wouldn't have been exposed
36 to the same kind of pressure. Do you agree with
37 that?
38 DR. KIBENGE: I agree, yeah.³²

The evidence of Dr. Miller makes it abundantly clear that researchers must be independent from the political activities of government so that they can engage in unbiased and objective scientific inquiries, and assist management in making evidence-based policy decisions. The degree to which senior managers appear to be interfering in Dr. Miller's research and are focussed on avoiding or disproving ISAv is astonishing. This politically motivated conduct means that, in our submission, the Department is interfering in proper science and not making evidence-based decision that would advance its legislative responsibility to protect fish and fish habitat.

Recommendation:

DFO must ensure that their scientists have sufficient independence from the political sphere and have the necessary resources to pursue their research. DFO scientists must be free to pursue important and timely scientific questions, do so using the best available methodology and then publish their work. They must also be free to speak to the media about their research. DFO scientists must also be recognized as experts who can educate DFO management so that evidence-based decision-making takes place.

Further, as stated in our Initial Final Submission, DFO should develop clear research goals and performance measures for its research program that are in line with its conservation mandate, and ensure transparency surrounding its research program and their results.

Finally, CFIA's apparent policy of seizing samples that test positive for a reportable disease should be reviewed as it appears to have a negative effect on independent research and analysis by scientists like Drs. Miller, Kibenge, Routledge and Nylund who are at risk of not being able to continue with their research and testing because of the positive results and the seizure policy of CFIA.

³² Hearing Transcript (December 16, 2011), p. 33, l. 12 – 38.

5. DFO's Failure to Monitor for ISA on the Coast of BC

The evidence clearly indicates that DFO does not want to identify ISAv and has not been adequately testing for ISAv on the coast of British Columbia. Given the international experience where open-net aquaculture has led to ISAv outbreaks, this lack of monitoring is very concerning and leads one to wonder whether Government is interested in knowing whether fish farms are harming wild salmon stocks. Ms. Gagné stated very clearly that GFC Moncton, which is the DFO lab responsible for ISAv testing, has not been testing in BC since 2004 including during the 2009 sockeye collapse:

12 Q Thank you. Had you had occasion to test west
13 coast or B.C. water fish for ISA before this fall?
14 I have to mind that you've already talked about
15 2004, and you may speak to that, but has there
16 been testing done by your lab of B.C. or Pacific
17 salmon before?
18 MS. GAGNÉ: Apart from the samples sent in 2004 and
19 this present notification, no.
20 Q And is there any particular reason why you
21 wouldn't have tested before?
22 MS. GAGNÉ: I think there's been surveillance done in
23 the past using cell culture as is traditional for
24 FHPR and this aligns using the PBS are susceptible
25 to ISAs or by -- by this fact they would if there
26 was ISA in cell culture, they would have seen it.
27 But recently, to my knowledge, there is beginning
28 of surveillance that was done by the PBS lab, the
29 Aquatic Animal Health section --
30 Q All right.
31 MS. GAGNÉ: -- the Fish Health --
32 Q Is testing that you do done on a referral basis?
33 MS. GAGNÉ: It used to be surveillance of wild fish,
34 but with the work that started with the NAAHP in
35 2005 and the ISO implementation, et cetera, so we
36 have kind of moved away, temporarily, from
37 surveillance of wild fish to get the lab up and
38 running up to the ISO standards, which is a big
39 task. But we keep having -- we keep receiving
40 samples from like wild salmons collected for
41 various reasons and we have done regular testing

42 for ISA.³³

Further, Ms. Gagné confirmed that prior to Dr. Kibenge's results, her lab had never tested wild Pacific salmon.³⁴

During our cross examination of Dr. Jones, we inquired as to why Molly Kibenge's unconfirmed positive ISAV results in 2004 did not prompt more active and comprehensive surveillance for this virus.

44 Q Now, I come to the business of Dr. Molly Kibenge's
45 work back in 2004...

...

8 Q For the life of me, I don't understand why knowing
9 what you knew in 2004, albeit that you questioned
10 the veracity or the validity of Dr. Kibenge, Molly
11 Kibenge's work, that you didn't consider it
12 critical to instigate or initiate a surveillance
13 program in that period of time. Can you answer
14 why?

15 DR. JONES: Well, viral surveillance of Fraser River
16 sockeye has been underway since before 2004 and up
17 until this year. There's an annual surveillance
18 of Fraser River sockeye for viruses. They culture
19 virus or they culture tissues from these fish,
20 looking for viruses. What they find is IHN virus,
21 when they do find a virus. So there is a
22 surveillance program that is underway for viruses.

23 Q But as of 2004, ISAV got on your radar screen, if
24 only it was controversial. But the fact is it was
25 on your radar screen as of that date, correct?

26 DR. JONES: There were some lab results that indicated
27 the possibility of ISA.

28 Q Well, I say that goes on your radar screen,
29 doesn't it?

30 DR. JONES: We were obviously aware of that, so we
31 conducted, and we were aware of the significance
32 of that, as well. This is not something we
33 treated trivially. We conducted a lot of
34 confirmatory tests, and there's -- as a result of
35 those tests, we found that we could not confirm
36 the findings...

³³ Hearing Transcript (December 15, 2011), p. 64, l. 12 – 42.

³⁴ Hearing Transcript (December 16, 2011), p. 29, l. 45-46.

...

41 ... but I'm not aware of any specific target
42 ISA screening that was -- that's been continued.

...

40 Q ... But whatever its designation was,
41 you do recognize that Dr. Molly Kibenge's results
42 went to PEI and three positives found that were
43 her three positives, and as I read the material,
44 three positives she found that actually Dr. Molly
45 Kibenge did not find. Right?

46 DR. JONES: That's correct.

47 Q Right. That was of some significance, wasn't it?

1 DR. JONES: Well, it was also of significance, in my
2 mind, that three of seven that she'd identified as
3 positive could not be confirmed by Fred Kibenge's
4 lab. You know, so we were dealing with the
5 possibility of something quite significant
6 happening. We needed to be sure that the evidence
7 that we pulled together to support the claim of
8 ISAV was impeccable.³⁵

The fact that the evidence relating to the 2002 – 2004 research of Dr. Molly Kibenge was not disclosed prior to the recent ISAV testing is very concerning as it indicates one more way in which DFO has failed to be transparent to the public, and failed to produce documents that were extremely relevant to two key subjects of this Inquiry - the subject of disease and aquaculture. The failure of DFO to disclose this information and allow for this evidence to be considered as this Commission explores possible explanations for the sockeye collapse raises questions about what other information the Government has been withheld from the public record.

There is no reason to believe that DFO could not continue the ISAV testing that Dr. Molly Kibenge carried out under the supervision of Dr. Jones. Dr. Miller explained that, after testifying previously before the Cohen Commission, where many witnesses described the challenges in testing wild salmon, she had an insight into how to overcome those challenges.

35 ... after testifying at the
36 Cohen previously and listening to all of the
37 dialogue on how we actually study disease in wild
38 fish, I came away with that, really, with the

³⁵ Hearing Transcript (December 19, 2011), p. 73, l. 44 - 45; p. 74, l. 8 - 42; p. 75, l. 40 - 47; p. 76, l. 1 - 8.

39 feeling that we just didn't know very much about
 40 what pathogens wild fish even carry, and there was
 41 a general arm-waving that it was really pretty
 42 impossible to study disease in wild fish, because
 43 we didn't see them die.
 44 And so, you know, I went back and decided to
 45 start looking at this a little bit more carefully,
 46 and the first thing that I felt was needed was a
 47 good characterization of what pathogens actually
 1 exist in wild migrating salmon. And that doesn't
 2 tell you what causes disease, necessarily, but it
 3 tells you what's there. By doing those in a
 4 quantitative way, you can look at how much virus
 5 is present, so you can -- if you have very low CT
 6 values using quantitative assays you know that
 7 there's a high abundance of that pathogen and it's
 8 not a low abundance. So that's another way to
 9 gauge how important that might be at that
 10 particular time in the life cycle of the salmon.³⁶

DFO's failure to monitor for ISAV is nothing less than irresponsible and negligent, given the international evidence demonstrating the risk presented by open-net aquaculture and given the 2004 research of Dr. Molly Kibenge.

Recommendation:

DFO must immediately begin an active and rigorous surveillance and testing program of wild and farmed salmon on BC's coast with the objective of testing for ISAv, HSMI and all other pathogens that have been observed in fish farming areas in Canada and around the world.

6. Cooperation by the Aquaculture Industry in DFO Research on Disease

During Dr. Miller's evidence on August 25, 2011, she described previous requests to the BCSFA to test farmed salmon for various pathogens. In their reply submissions, the BC Salmon Farmers Association stated, "The suggestion that the aquaculture industry has not cooperated with Dr. Miller's research efforts is baseless and wrong."³⁷ However, during the ISAv hearings, we heard Dr. Miller discuss how clearly uncooperative virtually all fish farm companies are when it comes to participating in sampling and research. In fact, only Creative Salmon has permitted Dr. Miller

³⁶ Hearing Transcript (December 15, 2011), p. 48, l. 35 – 47; p. 49, l. 1 – 10.

³⁷ BCSFA Reply Submissions, Nov 3, 2011, p. 77 at para 142.

to test their farmed salmon. In what should be of great concern to the Cohen Commission, she found that 25% of the samples tested positive for ISAv.

13 Q Dr. Miller, let me ask you a little bit about the
14 Clayoquot Sound test from Creative Salmon. You
15 found -- I understand that Creative Salmon was the
16 one fish farm company that would cooperate with
17 you?

18 DR. MILLER: Yes, they were, which is unfortunate, that
19 the only result I have is from Creative Salmon
20 because I think they are a very forward-thinking,
21 cooperative and responsible company.

22 Q Yes. The fact that they were prepared to let you
23 test their fish shows a certain amount of
24 cooperation?

25 DR. MILLER: I actually -- I tested for general
26 pathogens. I did not discuss with them ahead of
27 time exactly what I was testing for there, but the
28 project was about trying to find out if there was
29 a virus that might be causing the jaundice
30 disease, and so I felt that doing the general
31 pathogen testing would at least screen out
32 possibilities of known viruses and known other
33 pathogens.

34 Q And you found over 20 percent of the fish you
35 tested had ISA?

36 DR. MILLER: That was the same rate that we find in
37 wild migrating sockeye salmon, as well.

38 Q But that was what percentage?

39 DR. MILLER: It was 25 percent.

40 Q 25 percent of the fish in that fish farm are
41 testing positive for ISA under your test?

42 DR. MILLER: Yes, with similar CT values of what we see
43 in wild migrating fish so they're high CTs so low
44 copy number.³⁸

Mr. McDade went on to ask whether other viruses were found in the samples from Creative Salmon:

45 Q Did you find other viruses of note in their fish?

46 DR. MILLER: Yes, we did.

47 Q What?

³⁸ Hearing Transcript (December 15, 2011), p. 112, l. 13 – 44.

1 DR. MILLER: We're still doing sequence confirmation of
2 some of this and this is ongoing research and I'd
3 rather not go into a lot of detail in what we did
4 find in those fish, but ISA was not the one I was
5 most interested in.

6 Q Did you find HSMI?

7 DR. MILLER: We did find fish positive for the
8 pasendrial (phonetic) virus, which is thought to
9 be causing HSMI.

10 Q Dr. Nylund, you know about HSMI in Norway, do you?

11 DR. NYLUND: Yes, I know quite a lot about it.

12 Q Were you aware that it had been found in Canada,
13 on the West Coast?

14 DR. NYLUND: Not in Canada, but I know it has been
15 found in Chile, who has been importing embryos
16 from Europe.

17 Q And that's a significant disease of concern in
18 fish farms in Norway?

19 DR. NYLUND: Yes, it gives up to 10 percent losses in
20 detected farms and up to 100-percent morbidity.
21 And it effects the muscle of the fish so it may
22 reduce the quality of the fish.

23 Q And that's not been found, as far as I know, Dr.
24 Miller, in any place to date?

25 DR. MILLER: We see positives for that in our sockeye
26 salmon, as well.

27 Q You're beginning to see positives for HSMI in
28 sockeye?

29 DR. MILLER: Not for HSMI, the disease, we see
30 pasendrial virus in our wild migrating sockeye
31 salmon.

32 Q And has that finding been disclosed publicly
33 before today?

34 DR. MILLER: No, this is research in progress.³⁹

Dr. Miller described how, following her testimony before the Cohen Commission in August 2011, she understood that she had a verbal agreement with the BCSFA that they would work with her and provide samples of healthy fish from the farms for testing. Dr. Miller testified that she wrote a proposal regarding that testing and was met with resistance from BCSFA.

3 ...I did not feel that

³⁹ Hearing Transcript (December 15, 2011), p. 112, l. 45 – 47; p. 113, l. 1 - 34.

4 what they proposed was what we originally had
 5 talked about and what I had said that we were
 6 going to do in the Cohen Inquiry and I did feel
 7 that there was no need to move forward. I didn't
 8 need them to run sockeye salmon, I needed them to
 9 provide Atlantic salmon to test.

10 Q And they said they would in a stepped approach,
 11 correct?

12 DR. MILLER: They wanted a level of control over the
 13 data and the information that we have in sockeye
 14 salmon and I was not willing to give that level of
 15 control on our sockeye salmon when we have the
 16 samples, there are samples in our lab.

17 Q Which you could have tested?

18 DR. MILLER: We have tested.⁴⁰

This evidence provides further support for our recommendation that Canada must establish regulations requiring DFO scientists to conduct research on fish farms in order to monitor the rates of ISAV on fish farms, along with any other pathogens that may be present.

Recommendation:

This evidence supports our recommendation from our Initial Final Submission that Canada must establish regulations requiring DFO scientists to conduct testing and research on fish farms.

7. Adequate Funding and Independence for DFO Researchers

The ISAV Hearings have further highlighted the need for proper funding for science, such as the research of Dr. Miller, who are examining these critical issues of wild salmon health on the BC coast. Dr. Kibenge suggested that:

1 ... I would suggest
 2 is that I think probably the government or someone
 3 should set up some sort of a fund or research
 4 chair, so to speak, so that we'd get some expert
 5 who focuses on aquatic virology and get to the
 6 bottom of most of these issues. We have seen and
 7 heard, you know, Canada has some expertise here.
 8 I heard from Dr. Miller, I think she is the -- a

⁴⁰ Hearing Transcript (December 15, 2011), p. 103, l. 3 – 18.

9 very accomplished scientist that could easily be
10 used.⁴¹

Recommendation:

In our Initial Final Submission, we recommended that Canada properly fund DFO's scientific activities in order to ensure that the Department is able to make effective, evidence-based decisions regarding fisheries management and conservation.

8. Conclusion and Recommendations

In conclusion, we submit that the evidence from the ISAv Hearings supports the following findings of fact. First, in the fall of 2011, Drs. Kibenge and Miller carried out sound research that resulted in positive findings of ISAv or an ISAv-like virus in BC wild and farmed salmon. Second, DFO and CFIA engaged in a public campaign to cover-up or discredit Dr. Kibenge's ISAv test results. Third, DFO has not been testing for ISAv, despite the clear risk that BC faces given active open-net aquaculture and that the research of Dr. Molly Kibenge was sufficient for the various levels of government to engage in an active ISAv surveillance program. Fourth, DFO has attempted to undermine the work of Dr. Miller whose high-calibre research program is researching urgent and relevant questions regarding the health of wild salmon in BC. Finally, BC aquaculture companies, save an except for Creative Salmon, have been generally resistant and uncooperative in terms of DFO sampling of farmed salmon.

We, therefore, suggest that the Commissioner consider the following recommendations:

1. Immediately remove fish farms from the Fraser sockeye migration routes, and relocate these farms to areas where potential contact with all species of wild salmon populations is eliminated.
2. All future siting decisions should recognize that pathogens, and particularly ISAv, from fish farms present a significant risk to wild salmon populations.
3. DFO should no longer be involved in aquaculture industry promotion, liaison or public affairs regarding aquaculture related matters.
4. We also recommend the creation of an independent panel of experts that oversee the operations of DFO and CFIA, particularly in regards to monitoring of pathogens in wild

⁴¹ Hearing Transcript (December 16, 2011), p. 50, l. 1 - 10.

and farmed salmon, and reports semi-annually to the Canadian public and Government through the filing of a report to Parliament and to the Auditor General of Canada.

5. DFO must ensure that their scientists have sufficient independence from the political sphere and have the necessary resources to pursue their research. DFO scientists must be free to pursue important and timely research questions, do so using the best available methodology and permitted to publish their work and speak freely with the media.
6. DFO must recognize their scientists as experts who can educate DFO management to support evidence-based decision-making within the Department.
7. DFO should develop clear research goals and performance measures for its research program that are in line with its conservation mandate, and ensure transparency surrounding its research program and their results.
8. CFIA's apparent policy of seizing samples that test positive for a reportable disease should be reviewed.
9. DFO must immediately begin an active and rigorous surveillance and testing program of wild and farmed salmon on BC's coast with the objective of testing for ISAv, HSMI and all other pathogens that have been observed in fish farming areas in Canada and around the world.
10. Canada must establish regulations requiring DFO scientists to conduct testing and research on fish farms
11. Government should properly fund DFO's scientific activities in order to ensure that the Department is able to make effective, evidence-based decisions regarding fisheries management and conservation.

Respectfully Submitted.

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