Written Submissions
for
the House of Commons'
Standing Committee on Fisheries and Oceans'
Study of
Science at Fisheries and Oceans Canada

Submitted by

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1. The Importance of the Committee's Work

I thank the Committee for its study into science at Fisheries and Oceans Canada ("**DFO**") and for inviting me to appear as a witness. Although I cannot attend in person, I provide these submissions to aid the Committee's work. Ten years advocating on behalf of wild salmon have convinced me that rearing Atlantic salmon in British Columbia in open net-pen feedlots depends on DFO suppressing and misrepresenting science to DFO decision makers, Members of Parliament and the public.

I am also convinced that DFO does not avoid conflicts of interests; it openly embraces them. As Mr. Justice Cohen predicted, DFO is captured by the feedlot industry:[1] by avoiding legally required protections,[2] DFO prioritizes the promotion of open net-pen feedlots over its primary mandate to protect and conserve fish.[3] DFO is repeating the same conduct that led to the collapse of the Atlantic cod fishery: routinely suppressing research inconvenient to industry,[4] concealing evidence contrary to policy,[5] and avoiding disclosing "the full scientific truth."[6]

Tens of thousands of pages of internal DFO correspondence demonstrate DFO consistently suppressing and misrepresenting evidence of the harm open net-pen feedlots cause wild Pacific salmon. The scope and consistency of DFO's misfeasance confirms this conduct is not the product of a few bad apples, but a poisoned orchard.

I appreciate the Committee's work to study this persistent misfeasance. I hope it will recommend a more encompassing investigation, beyond what this Committee could undertake, leading to the reform of DFO and the protection of wild Pacific salmon.

2. DFO Avoids its Legal Duty to Protect and Conserve Fish

Passed after the collapse of the Atlantic cod fishery, the *Oceans Act* requires the Minister of Fisheries and Oceans (the "**Minister**") to implement the precautionary approach – ***to err on the side of caution***. The *Fisheries Act* requires the Minister to protect and conserve fish. The *Fishery (General) Regulations* require the Minister to implement the precautionary principle – ***to anticipate, attack and prevent sources of harm*** – and to ensure that open net-pen feedlots are not stocked with fish carrying disease agents that may be harmful to the protection and conservation of fish. The Federal Court has twice confirmed that DFO avoids this legal duty.[7] To avoid its legal duties, DFO denies any source of harm by suppressing, ignoring and misrepresenting science.

Wild First has dozens of examples of DFO's suppression. These submissions focus on four:

- For more than a decade, DFO suppressed research showing a lethal disease in farmed Chinook was associated with the foreign Piscine orthoreovirus ("**PRV**").
- DFO misrepresented scientific findings to DFO decision makers, including how to diagnose Heart and Skeletal Muscle Inflammation ("**HSMI**"), a disease caused by PRV in Atlantic salmon.
- DFO gave industry veterinarians a "vote" on how to diagnose HSMI knowing that a diagnosis of HSMI in British Columbia would prevent stocking feedlots with PRV-infected fish. DFO knew industry would vote to make it impossible to diagnose HSMI.

- DFO continues to suppress, misrepresent, and ignore peer-reviewed research demonstrating that *Tenacibaculum maritimum* ("**Tenacibaculum**"), is associated with population-level impacts to sockeye, Chinook and coho salmon.

3. DFO Suppressed Evidence PRV is Associated with Disease in Chinook

For a decade, DFO suppressed research indicating PRV caused a fatal disease in endangered Chinook, specifically, a disease causing their red blood cells to explode *en masse*. DFO kept this research out of any risk assessments, while contemporaneously collaborating with industry on, now disproven, PRV research. DFO not only suppressed evidence of harm, it unsuccessfully colluded with industry in an attempt to refute it. DFO effectively gave industry a veto over the research it would consider in its risk assessments.

It did so because, if PRV may cause or contribute to disease, then DFO must prohibit stocking of feedlots with PRV-infected fish. The feedlot companies would not like that: in 2017, the Managing Director of Marine Harvest swore an affidavit confirming that Marine Harvest would be severely impacted if it could not stock its farms with PRV-infected fish.[8]

In 2010, scientists in Norway discovered PRV,[9] which causes HSMI in Atlantic salmon.[10] In 2011, Dr. Miller-Saunders discovered that jaundice anemia in farmed Chinook was strongly associated with PRV infection.[11] This suppressed research only became public through a multi-year effort to have it released under the *Access to Information Act*. Its release attracted national and international headlines.[12]

Dr. Miller-Saunders' research was the first detection of PRV in British Columbia and the first evidence that PRV was associated with disease in wild Pacific salmon in British Columbia.[13] At the time, her research was leading edge.

Despite her extraordinary efforts to have the research published,[14] DFO managers steadfastly prohibited Dr. Miller-Saunders from submitting this research for publication because two co-authors, Dr. Gary Marty and Dr. Sonja Saksida, both industry veterinarians, refused to approve the submission, even after Dr. Miller-Saunders removed their intellectual property from the draft, removed them as co-authors, and despite the collaboration agreement not giving those authors a veto over publication.[15]

DFO's suppression of Dr. Miller-Saunders' research is an example of DFO embracing conflicts of interest. After the British Columbia Supreme Court confirmed finfish aquaculture was within federal jurisdiction in 2009,[16] DFO contracted the Province's Animal Health Centre to perform the diagnostic services necessary to implement DFO's regulation of the open net-pen feedlot industry. Dr. Gary Marty was the Province's veterinarian responsible for those diagnostic services. Yet, while performing those diagnostic services for DFO through the Province's laboratory, Dr. Marty also worked as a contractor for industry licensees. Wild First understands that Dr. Marty was working as a contractor for an industry licensee when he refused to approve, as a co-author, the submission of Dr. Miller-Saunders' research for publication.

DFO refused to release the research to me under the *Access to Information Act*. I filed a complaint, which DFO fought for years. Finally, the Information Commissioner found my complaint was well-founded and, in 2022, the Minister released Dr. Miller-Saunders' draft manuscript and project report. The Information Commissioner found:

- the collaboration agreement DFO managers relied on to suppress the research was "extraordinarily broad"[17] in DFO's favour;

- DFO had no lawful reason to withhold the research; and
- even if DFO had a lawful reason to withhold the research, it would have been "incumbent"[18] on DFO to consider releasing the research in the public interest.

During the decade DFO suppressed this research, DFO never considered it in risk assessments. When First Nations or ENGOs asked for this research, DFO managers claimed it could not release or consider unpublished research, while at the same time, preventing its publication and including other draft research in its risk assessments.[19]

3.1 DFO Colluded with Industry to Attempt to Debunk the Suppressed Research

Shortly after Dr. Miller-Saunders' discovery, DFO began collaborating with industry licensees on four, now debunked, papers to undermine Dr. Miller-Saunders' research.[20] That research became the backbone of DFO's unlawful policy to allow companies to stock their feedlots with PRV-infected fish:

- DFO used two of those papers to claim that PRV was in British Columbia before feedlots:
  - Marty et al. (2014)[21] cited a suspect detection of PRV in a tissue sample of steelhead trout, stored since 1977, as proof that PRV was in British Columbia before open net-pen feedlots of Atlantic salmon.[22] However, the genetic sequence of that sample is ***identical*** to the genetic sequence from a sample from a later time period, indicating the detection of PRV in the 1977 sample was likely the result of contamination. [23]
  - Siah et al. (2015) concluded that PRV could not be a recent introduction to the Pacific, but the authors soon retracted that conclusion in a rare correction.[24]
  - Two subsequent papers confirmed that PRV was introduced from the Atlantic.[25] Mordecai et al. (2021) suggests the open net-pen industry as the source.[26]
- DFO used two papers to claim that, despite PRV causing disease everywhere else, PRV from British Columbia does not cause disease:[27]
  - Garver et al. (2015) concluded that PRV does not cause jaundice anemia.[28] Garver et al. (2016) concluded that PRV from British Columbia failed to induce HSMI in Atlantic salmon or sockeye.[29]
  - In 2018, Dr. Garver admitted under cross-examination that 87% of the Chinook exposed to PRV had lesions diagnostic of jaundice.[30]
  - During his studies, Dr. Garver, a DFO scientist, supplied Dr. Rimstad, a Norwegian expert with PRV from British Columbia.[31] In 2016, Dr. Rimstad appears to have reported to Dr. Garver that the PRV from British Columbia caused disease.[32]
  - Wessel et al. (2020)[33] confirmed that PRV from British Columbia causes disease. Dr. Rimstad was a co-author. Despite the collaboration between Dr. Garver and Dr. Rimstad, Dr. Garver was not listed as a co-author.

Industry funded three of the above papers. Mowi Canada West's current managing director co-authored three. Each one of these four papers had a co-author that objected to the publication of Dr. Miller-Saunders' suppressed research: Dr. Gary Marty co-authored three of the four papers; Dr. Sonja Saksida co-authored two of the four papers. On their say so, DFO refused the publication of Dr. Miller-Saunders' research, despite her findings being confirmed in subsequent peer-reviewed papers.[34] Conversely, DFO continues to rely on industry-funded and co-authored research to inform its policy not to prohibit the transfer of smolts infected with PRV

into open-net pens (the "**PRV Policy**"), despite those papers being disproven, or substantially undermined, by subsequent peer-reviewed publications.[35]

By refusing to allow Dr. Miller-Saunders to publish her research because industry scientists objected to it, and relying on industry funded and co-authored research, DFO gave industry a veto over what scientific evidence DFO considered. When doing so, DFO breached multiple provisions of its own Policy on Science Integrity, including the requirement to keep its research "free from" stakeholder interference.[36] Despite being aware of Dr. Miller-Saunders' research, DFO unlawfully allowed companies to stock their feedlots with PRV-infected fish – conduct twice found unlawful by the Federal Court.[37] DFO also failed to report PRV as an emerging disease to the World Organisation for Animal Health (the "**OIE**").[38]

Wild First understands that Jay Parsons, Director, Aquaculture, Biotechnology and Animal Health Branch, and Dr. Gary Marty of the Animal Health Centre, were integral in the suppression of Dr. Miller-Saunders' research.[39] **Wild First suggests that the Committee recommend that their conduct, and potentially the conduct of others, be investigated further, and if appropriate, sanctioned.**

4. DFO Managers Lied to DFO Decision Makers about Scientific Findings

DFO repeatedly misrepresents scientific findings in advice to DFO decision makers. The table below provides some typical examples. I cannot stress enough that this table does not provide examples of scientific debate or uncertainty. It provides examples in which ***DFO managers are unequivocally lying to DFO decision makers about what scientific papers say***.

DFO Misrepresentations Of Scientific Findings		
Canadian Science Advisory Secretariat, Science Response 2015/037, "Assessment of the Occurrence, Distribution and Potential Impacts of Piscine Reovirus [PRV] on the West Coast of North America." ("2015 CSAS")		
DFO Misrepresentation	**Statement in Scientific Papers**	**Comments**
The 2015 CSAS was DFO's response to *Morton 2015* and was used to justify its PRV Policy. DFO denied HSMI exists in British Columbia and claimed diagnosis of HSMI required microscopic (histopathological) lesions in the heart and skeletal tissue AND clinical signs (lethargy, anorexia, mortality): "The lesions reported in fish with HSMI are similar to those that are reported for other diseases such as PD [Pancreas Disease] (caused by salmonid alphavirus), CMS [Cardiomyopathy Syndrome] (caused by piscine myocarditis virus), and a recently described disease in Rainbow Trout that is associated with the presence of genetic material from a reovirus related to PRV (Kongtorp,	Since 2004, scientists across the world concluded just the opposite: ***HSMI is diagnosed solely by observation of lesions in the heart and skeletal muscles.*** "It is concluded that HSMI is histopathologically distinguishable from PD and CMS."[41] "Pancreas disease and CMS are the most relevant differential diagnoses to HSMI ***at the histopathological level***"(bolding and italics added).[42]	DFO said it needed to include "clinical signs" to differentiate HSMI from PD and CMS. DFO did not cite any scientific paper for its statement that clinical signs are required to distinguish HSMI from PD and CMS. There are none. As the papers cited in the second column (and others) illustrate, scientists had distinguished HSMI from PD and CMS using only histopathology for more than a decade before DFO claimed "clinical signs" were necessary to do so. Further, as DFO confirmed on p. 9 of the 2015 CSAS, the viruses that cause PD and CMS are not even

Taksdal, and Lyngoy 2004; Olsen *et al.* 2015). ***For this reason, HSMI cannot be definitively diagnosed by histopathology, unless the affected fish on the farm also have clinical signs consistent with HSMI"*** (bolding and italics added).[40]		present in British Columbia.
March 2018 Rapid Science Response		
DFO Misrepresentation	**Statement in Scientific Paper**	**Comments**
DFO used the March 2018 Rapid Science Response to reaffirm its unlawful PRV Policy in March 2018. DFO managers said that Di Cicco et al. (2017) concluded fish used to stock feedlots were free of PRV and used that as proof that the PRV infected fish originated at sea: "Di Cicco [et al. (2017)] …. importantly provided evidence that infection of farmed fish with PRV in this instance was via a marine reservoir since the fish were free of PRV upon entry into previously fallowed sea-water net-pens."[43]	Di Cicco et al. (2017) never said that: "Following a four-month fallowing period, ***the farm was fully stocked with approximately 50–55,000 fish per pen*** over twelve pens in May 2013 with Atlantic Salmon smolts originating from two different hatcheries at week 17–19 of production cycle (body weight > 100 g). However, one pen received salmon in early April from another ocean production site (but still coming from one of the same hatcheries) at week 6 (body weight > 90 g) after they were transferred into the ocean. ***Ten fish from each of the two hatcheries underwent testing for PRV prior to the ocean transfer; all fish tested negative***" (bolding and italics added).[44] "Risk assessment will require further studies, ***but PRV has been detected in most Pacific salmon species that have been tested in BC, Washington and Alaska, at lower prevalence than on farms (0–21% vs >70%)***" (bolding and italics added).[45]	Di Cicco et al. (2017) said that 20 (10 x 2) out of 600,000 to 660,000 fish tested negative for PRV before being placed in that farm. This is far too small a sample size to conclude, as DFO does, that "the fish were free of PRV." And, that leaves aside that Di Cicco et al. (2017) said nothing about the sampling methods used. DFO also fails to mention that Di Cicco et al. (2017) expressly noted that prevalence of PRV on fish farms is significantly higher (> 70%) than it is in fish in the ocean (< 21%). Di Cicco et al (2017) thus pointed directly to the opposite conclusion: the farmed fish were the source of the PRV.
June 2018 Rapid Science Response		
DFO Misrepresentation	**Statement in Scientific Paper**	**Comments**
The June 2018 Rapid Science Response was used to reaffirm DFO's unlawful PRV Policy and addressed only Di Cicco et al. (2018), which concluded that the strain of PRV causing HSMI was causing jaundice in Chinook.	The published paper said that infected fish had multiple lesions: "Among the Chinook Salmon, however, several microscopic lesions clearly separated the challenged fish from the non-injected controls. The most distinctive lesions in the	Despite DFO unequivocally saying that its challenge studies did not induce histological evidence of Jaundice Syndrome, ***the paper itself expressly identified 10 different types of lesions in Chinook salmon*** that were not present in the control group.

DFO said a challenge study showed no histological evidence of disease: "Tissues from these fish were homogenized and injected into naïve Chinook, Sockeye and Atlantic salmon in an attempt to recreate Jaundice Syndrome in these fish. ***Examination of the fish after 22 weeks showed no gross or histological evidence of Jaundice Syndrome***, although all of the fish tested positive for high levels of PRV" (bolding and italics added).[46]	challenged fish were hepatocellular cytoplasmic iron-rich pigment granules (87% affected, Fig. 3) and renal erythrophagocytosis (also 87% affected, Fig. 4); neither of these lesions occurred among the control fish. Other lesions that affected only challenged fish – all of mild severity – included hepatocellular cytoplasmic vacuoles (33%), leucocytic hepatitis (33%), renal tubular cytoplasmic protein droplets (20%), renal glomerular protein deposits (20%), myocardial karyomegaly (20%) and lymphohistiocytic endocarditis (60%). Lesions that occurred in only the control fish included mild hepatocellular hydropic degeneration (50%) and mild renal mineralization (75%)."[47]	***Furthermore, during cross-examination, Dr. Kyle Garver, the lead author, confirmed that at least erythrophagocytosis lesions are symptomatic of Jaundice Syndrome, which 87% of the challenged Chinook had***.[48]

DFO decision makers relied on the misrepresentations above to maintain DFO's policy to allow companies to stock their feedlots with PRV: conduct the Federal Court twice found unlawful.[49]

The misrepresentations listed above violate DFO's Policy on Science Integrity.[50] Wild First understands that Carmel Lowe, former Regional Director, Science was responsible for overseeing the two Rapid Science Responses described above and the 2015 CSAS, which Jay Parsons, Director, Aquaculture, Biotechnology and Animal Health Branch participated in.[51] **Wild First suggests that the Committee recommend that their conduct be investigated further, and if appropriate, sanctioned.**

5. <u>DFO Let Industry Decide how to Diagnose HSMI</u>

DFO avoided its legal obligation to prohibit companies from stocking their feedlots with PRV-infected fish by denying PRV causes HSMI in British Columbia:

1. First, the Province's Animal Health Centre, then DFO, departed from international standards for diagnosing HSMI, because industry licensees said "clinical signs" were required.

2. Second, the Province's Animal Health Centre, then DFO, did not collect the samples of skeletal tissues required to diagnose HSMI.

3. Third, DFO invented its own case definition for HSMI, that to my knowledge, no one else in the world uses and DFO allowed industry licensees to "vote" on it. Wild First's scientific advisors have informed me that case definitions for diagnosing disease emerge from peer-reviewed science, not popular vote.

Allowing industry licensees to determine, or vote on, how to diagnose HSMI created a significant conflict of interest and violated DFO's Policy on Science Integrity.[52] By law, DFO cannot allow companies to stock their feedlots with disease agents. Diagnosing HSMI in British

Columbia, when PRV is the only known cause of HSMI, would confirm that PRV is a prohibited disease agent and that industry cannot stock their feedlots with PRV-infected fish.

In 2017, the former Managing Director of Marine Harvest (now Mowi) swore an affidavit confirming that banning companies from stocking their feedlots with PRV-infected fish would severely impact Marine Harvest.[53] Yet, in 2019, DFO let Diane Morrison, the current Managing Director of Mowi (previously, Marine Harvest), vote on how to diagnose HSMI, despite Ms. Morrison having fiduciary obligations to Mowi's shareholders to prevent the financial impacts her predecessor testified about. DFO embraced, rather than avoided, this clear conflict of interest.

DFO's conduct defies credulity. The Canadian public would have been appalled if Health Canada allowed tobacco company executives to vote on how to diagnose lung cancer. I have no doubt they will be similarly appalled by DFO's conduct.

5.1 The Province, then DFO, Departed from International Standards

The scientific community accepts PRV causes HSMI.[54] The rest of the world, including Norway, Chile and Scotland, diagnose HSMI by the observation of histopathological lesions in the heart and skeletal tissue of fish infected with PRV – ***no other symptoms are required*** (the "**International Standard**").[55] However, since 2008, in addition to the International Standard, DFO has also required "clinical signs" of disease – gross symptoms, including lethargy and weight loss – to diagnose HSMI (the "**DFO Case Definition**"). Dr. Gary Marty confirmed that in 2008, the Province adopted the DFO Case Definition because industry veterinarians told him that diagnosing HSMI required clinical signs.[56] DFO continued to use the DFO Case Definition to deny HSMI occurs in British Columbia even after a peer-reviewed publication diagnosed HSMI in British Columbia feedlots using the International Standard.[57]

5.2 The Province, then DFO, Did Not Collect Required Skeletal Samples

For almost a decade, the Province's and DFO's surveillance programs did not collect or examine the tissue samples from skeletal muscle necessary to diagnose HSMI – Heart and ***Skeletal Muscle*** Inflammation. Without skeletal tissue samples, it would have been impossible for DFO to diagnose HSMI.[58]

Dr. Gary Marty, the diagnostic veterinarian during that time (first for the Province and then as a contractor for DFO) said he began observing lesions diagnostic of HSMI in 2004[59] in his position as veterinarian with the Province's Animal Health Centre. Though Dr. Marty first observed HSMI lesions in 2004, the Province's diagnostic laboratory only started collecting skeletal muscle tissue samples after 2013.[60] According to Dr. Marty, HSMI had not been diagnosed in British Columbia by 2016.[61] Not sampling skeletal muscle tissues for a over a decade not only made it impossible to diagnose HSMI during that time, it makes it impossible to understand the historical prevalence of the disease during that decade.

5.3 Industry Voted to further Depart from International Standards, DFO Followed

In 2019, DFO convened a 17-member workshop of veterinarians to "vote" on the case definition for HSMI for DFO to use.[62] They met behind closed doors. The British Columbia feedlot industry or agencies that promote it employed 12 of the 17 participants.[63] DFO stacked the room. Tellingly, Wild First is informed that the Norwegian expert who attended refused to "vote".

Unsurprisingly, industry voted for an even narrower DFO Case Definition, adding numerous other criteria which make it virtually impossible for DFO to diagnose HSMI:

- clinical signs and/or farm-level mortality attributable to disease;
- signs of gross pathology;
- heart and skeletal lesions;
- confirmation of PRV infection;
- audit of 15 dead and 15 live fish showing histopathology consistent with HSMI;
- laboratory challenge trials; and
- ongoing field investigations demonstrating persistent clinical signs and/or population-level mortality (the "**New DFO Case Definition**").[64]

The New DFO Case Definition contrasts starkly with the International Standard: lesions in the heart and skeletal muscles with PRV infection.[65] The required challenge studies would take years and would replicate a decade of scientific study. Notably, in 2004, the scientific community confirmed the International Standard without having confirmed PRV caused HSMI.[66] A challenge study conclusively proving PRV caused HSMI did not occur until 13 years later, in 2017.[67] By requiring field studies demonstrating population-level harm, DFO requires proof of the very harm it is mandated to prevent to have occurred before it will act. DFO has abandoned the precautionary principle and its mandate to protect and conserve fish: it will not act until it is too late.

By industry vote, DFO also rejected the need for a case definition for individual fish and instead adopted a case definition for a larger epidemiological unit, the feedlot. This outcome is contrary to best practices as described by the OIE [68] and logically absurd. DFO will only diagnose an individual fish with HSMI if there is population-level mortality caused by HSMI. This requirement creates a logical impossibility: DFO cannot attribute population-level mortality to HSMI because it does not diagnose individual fish with HSMI; but, DFO cannot diagnose HSMI in any individual fish because the requisite population-level mortality caused by HSMI has not been confirmed. The New DFO Case Definition makes it impossible to have a necessary precondition to diagnose HSMI in either an individual fish or a population.

Rather than confront the harm DFO is mandated to prevent, DFO defines the harm out of existence and turns a blind eye to its regulatory duties. The COVID-19 pandemic is illustrative. If British Columbia had adopted the same approach, it would not have acted until an entire population, such as the City of Vancouver, had experienced a predetermined level of mortality, before recognizing COVID-19 was even present. Only when hundreds or thousands had died, would British Columbia have admitted COVID-19 was present and began testing individuals for the novel coronavirus or diagnosing COVID-19.

DFO's case definitions for HSMI confirm DFO has abandoned protecting wild fish from disease from open net-pen feedlots and DFO does not adhere to the precautionary principle. DFO does not anticipate, attack and prevent harm. DFO requires others to prove harm before acting. But, unfortunately, when confronted with that proof, DFO denies it by adopting different standards

than anywhere else in the world, sits on its hands, and watches wild Pacific salmon slide closer to extinction.

By allowing industry licensees to repeatedly determine the case definition for HSMI, DFO violated its own Policy on Science Integrity.[69] Wild First understands that Carmel Lowe, former Regional Director, Science was responsible for convening the vote to determine the New DFO Case Definition for HSMI and Gary Marty was integral to previous departures from international standards. **Wild First suggests that the Committee recommend that their conduct be investigated further, and if appropriate, sanctioned.**

6. DFO withholds Evidence of Population-level Harm from the Minister, Reports it to Industry

DFO managers withheld from the Minister crucial evidence demonstrating that Tenacibaculum from open net-pen feedlots is associated with population-level harm. Yet, DFO managers briefed industry licensees about this same research.[70] When First Nations asked DFO for this research, DFO managers refused to provide it.[71] Though this evidence of harm has been published in multiple peer-reviewed papers,[72] DFO continues to act as though it does not exist.

The Strategic Salmon Health Initiative ("**SSHI**") researched how Tenacibaculum from open net-pen feedlots affects the survival of wild Pacific salmon. The SSHI found that:

- Open net-pen feedlots consistently elevate levels of Tenacibaculum in the marine environment.[73]
- Fraser River sockeye appear to become infected with Tenacibaculum as they pass these open net-pen feedlots (especially those located in the Discovery Islands).[74]
- Of the 39 disease agents assessed, Tenacibaculum was one of the disease agents most highly correlated with poor survival rates in sockeye, Chinook and coho salmon.[75]

DFO had this research before the Minister's December 16, 2020 decision to phase out open net-pen feedlots from the Discovery Islands (the "**Discovery Islands Decision**"), but did not share it with her. The advice DFO provided to the Minister for the decision did not include it. But, DFO managers told industry about it, saying that Tenacibaculum infection "in Chinook, Coho and Sockeye juvenile salmon [is] associated with poor body condition and potentially indicative of poor health outcomes and subsequent returns".[76] When two Discovery Islands First Nations asked DFO for the research, the Regional Director of the Aquaculture Management Directorate told those Nations that there is "no evidence of disease in Pacific salmon caused by Tenacibaculum."[77]

SSHI researchers worked tirelessly to get this research into the Minister's hands. The day before the Discovery Islands Decision, Dr. Miller-Saunders forwarded a briefing note and technical summary, explaining that the SSHI's research was relevant to DFO's "risk framework pertaining to farms in the Discovery Islands but note that ***our models have revealed population-level associations with survival and condition with this agent more broadly for Chinook, coho and sockeye salmon***" (bolding and italics added).[78] Documents released under the *Access to Information Act* indicate that Dr. Miller-Saunders' briefing note and technical summary did not reach the Minister before the Discovery Islands Decision.[79]

The SSHI has now published three peer-reviewed papers, another has been accepted for publication and another is in draft, all on Tenacibaculum.[80] A year and a half later, DFO

continues to act as though the SSHI's research does not exist. In emails between Dr. Miller-Saunders, John Candy, Program Manager at the Pacific Biological Station, and Jon Chamberlain, Section Head, Oceans Modelling and Predictions, Dr. Miller-Saunders implores DFO to consider this evidence of harm:

- "I have to point out, this is not a one off publication pointing to this bacterium, but rather five papers from the SSHI and a series of other publications implicating T. maritimum [Tenacibaculum] with ulcerative diseases (tenacibaculosis) in Pacific salmon around the world."[81]
- "On top of these notable works [SSHI's five research papers], and ***in answer to the question that there is no evidence T. maritimum causes disease in Pacific salmon, I have compiled several papers worldwide that show that it does***" (bolding and italics added).[82]
- DFO ***"basically just brushes off the research as tentative and not in tune with the "comprehensive" CSAS conclusions***. So much for re-evaluating these assessments, which had many areas of high uncertainty, as new data become available. ***I was left with the impression that their response would be again to hand money to fish health to try to negate our conclusions. This has been Jay's response to any of our research that casts doubt on the assessment of minimal risk***" (bolding and italics added).[83]

Dr. Miller-Saunders describes Jay Parsons funding research aimed at refuting evidence contrary to DFO's promotion of the open net-pen feedlot industry. She describes this as a past practice. I believe Dr. Miller-Saunders is describing DFO's collaboration with industry on PRV research to attempt to refute her suppressed PRV research. See my comments above on this point.

By ignoring the SSHI's research, DFO has again violated its Policy on Science Integrity.[84] Wild First understands that Carmel Lowe, former Regional Director, Science and Jay Parsons, Director, Aquaculture, Biotechnology and Animal Health Branch were integral in keeping SSHI's Tenacibaculum research from DFO decision makers.[85] **Wild First suggests that the Committee recommend that their conduct be investigated further, and if appropriate, sanctioned.**

7. DFO is Captured by the Industry it Regulates

The open net-pen industry in British Columbia depends on DFO ignoring its legal duties and embracing conflicts of interest. DFO obliges by suppressing, misrepresenting, and ignoring the evidence that open net-pen feedlots cause harm to endangered wild Pacific salmon. Neither the Minister nor the Canadian public can trust DFO managers to accurately and truthfully report the evidence that open net-pen feedlots harm wild Pacific salmon. As endangered Pacific salmon spiral to extinction, DFO managers repeat the same shameful conduct that led to the collapse of the Atlantic cod fishery.

I thank the Committee for conducting this important study and for the opportunity to share what I have learned about how DFO operates. I ask that the Committee recommend further investigation into this important issue so that the scope of DFO's regulatory misfeasance can be fully documented and a comprehensive plan for reform can be developed. Without such transformation, the protection and conservation of Canada's public fisheries will remain in unsafe hands.

Endnotes

[1] See *The Uncertain Future of Fraser River Sockeye – The Final Report from the Commission of Inquiry into the Decline of Sockeye Salmon in the Fraser River* ("**Cohen Commission**") at Volume 3, p. 12. Access all three volumes of the Cohen Commission here: https://publications.gc.ca/site/eng/432516/publication.html.
[2] Cohen Commission, Volume 3, p. 12.
[3] *R v Sparrow,* [1990] 1 SCR 1075.
[4] "Unnatural Disaster: How Politics Destroyed Canada's Atlantic Groundfisheries," by Elizabeth Brubaker, printed as Chapter 5 in *Political Environmentalism: Going Behind the Green Curtain*, edited by Terry L. Anderson, Hoover Institution Press, Stanford University Press, 2000 ("**Unnatural Disaster**"), p. 167.
[5] "Unnatural Disaster," p. 167.
[6] "Unnatural Disaster," p. 186.
[7] *Morton v Canada (Fisheries and Oceans),* 2015 FC 575 ("***Morton 2015***"); *Morton v Canada (Fisheries and Oceans),* 2019 FC 143 ("***Morton 2019***").
[8] Affidavit of Vincent Erenst, dated January 18, 2017 ("**January 18, 2017 Erenst Affidavit**").
[9] M Løvoll, M Alarcón, B Bang Jensen, T Taksdal, AB Kristoffersen, T Tengs "Quantification of piscine reovirus (PRV) at different stages of Atlantic salmon *Salmo salar* production." *Dis Aquat Organ*. 2012; 99; 7–12, https://doi.org/10.3354/da002451.
[10] AB Mikalsen, P Nilsen, M Frøystad-Saugen, K Lindmo, TM Eliassen, M Rode, et al., "Characterization of a novel calicivirus causing systemic infection in Atlantic salmon (*Salmo salar* L.): Proposal for a new genus of Caliciviridae," *PLOS One* 9 (2014), https://doi.org/10.1371/journal.pone.0107132; AB Mikalsen, O Haugland, M Rode, IT Solbakk & O Evensen, "Atlantic salmon reovirus infection causes a CD8 T cell myocarditis in Atlantic salmon (*Salmo salar* L.)," *PLOS One* 7 (2021), https://doi.org/10.1371/journal.pone.0037269.
[11] Standing Committee on Fisheries and Oceans, Evidence Number 026 (April 26, 2021), p. 6.
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