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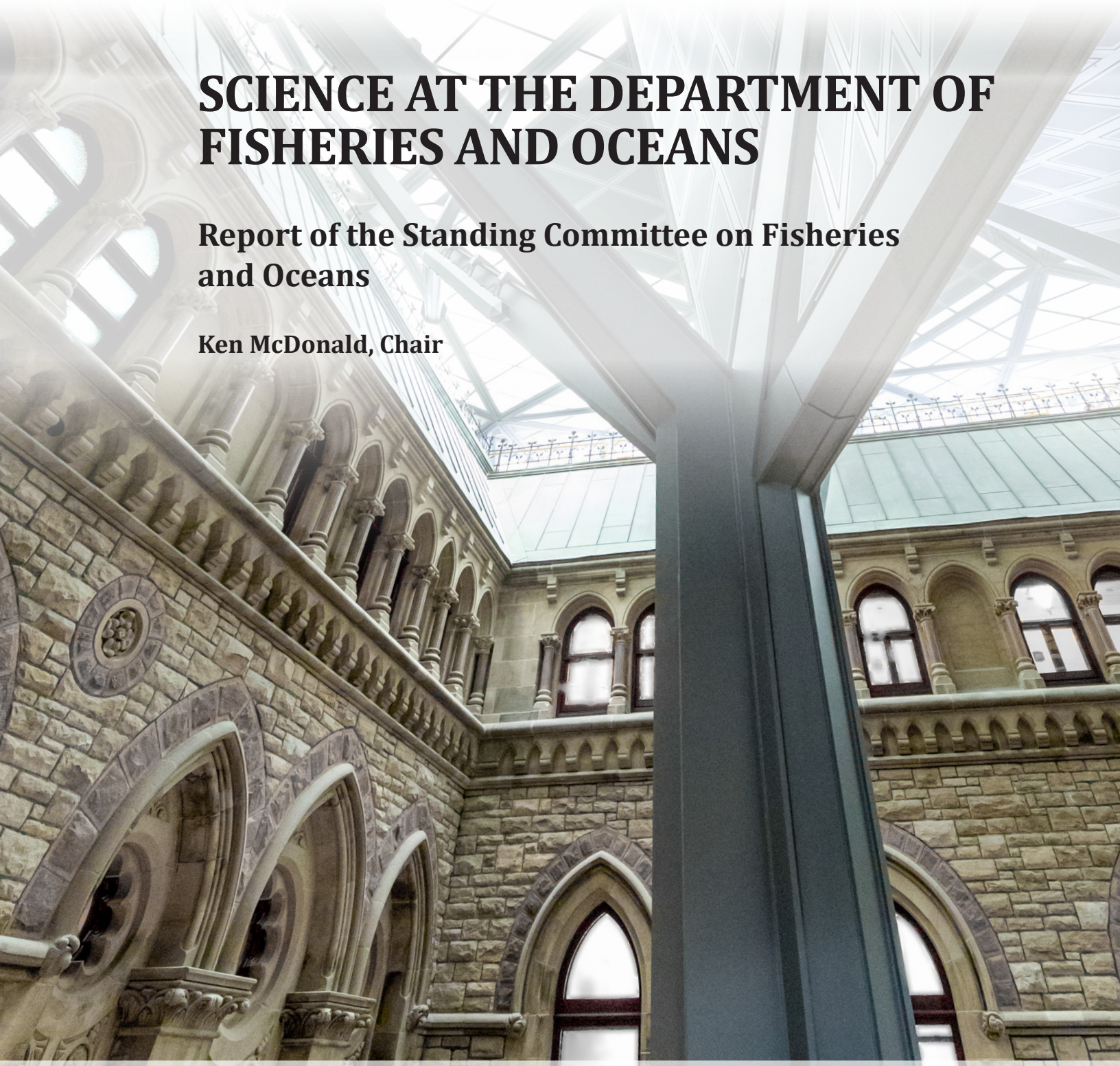

# SCIENCE AT THE DEPARTMENT OF FISHERIES AND OCEANS

## Report of the Standing Committee on Fisheries and Oceans

**Ken McDonald, Chair**

**MARCH 2023**
**44th PARLIAMENT, 1st SESSION**

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**Chair**

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## NOTICE TO READER

### Reports from committees presented to the House of Commons

Presenting a report to the House is the way a committee makes public its findings and recommendations on a particular topic. Substantive reports on a subject-matter study usually contain a synopsis of the testimony heard, the recommendations made by the committee, as well as the reasons for those recommendations.

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# THE STANDING COMMITTEE ON FISHERIES AND OCEANS

has the honour to present its

**EIGHTH REPORT**

Pursuant to its mandate under Standing Order 108(2), the committee has studied science at the Department of Fisheries and Oceans and has agreed to report the following:

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# GLOSSARY OF TERMS

**Cautious Zone**

A part of the precautionary approach in fisheries management. In the cautious zone, "decisions and strategies promote stock rebuilding to the healthy zone."[1]

**Critical Zone**

A part of the precautionary approach in fisheries management. In the critical zone, "stock growth is promoted and removals are kept to the lowest possible level."[2]

**Chief Science Advisor of Canada**

The Chief Science Advisors's key functions are as follows:

- "Provide advice on the development and implementation of guidelines to ensure that government science is fully available to the public and that federal scientists are able to speak freely about their work;
- Provide advice on creating and implementing processes to ensure that scientific analyses are considered when the Government makes decisions;
- Assess and recommend ways to improve the existing science advisory function within the federal government;
- Assess and recommend ways for the Government to better support quality scientific research within the federal system."[3]

**External Advisory Committee on Aquaculture Science**

Created in 2019, this committee is meant to ensure that, among other objectives, Fisheries and Oceans Canada has access to external perspectives when designing aquaculture research programs and policies. The creation of this committee stemmed

1 Government of Canada, *A Fishery Decision-Making Framework Incorporating the Precautionary Approach*.

2 Ibid.

3 Government of Canada, *Office of the Chief Science Advisor*.

from recommendations made in the 2018 *Report of the Independent Expert Panel on Aquaculture Science*.[4]

**Healthy Zone**

A part of the precautionary approach in fisheries management. In the healthy zone, "the fish stock status is good, and fisheries management decisions and harvest strategies are designed to maintain fish stocks within this zone."[5]

**Independent Expert Panel on Aquaculture Science**

A panel led by the Chief Science Advisor with the mandate of "providing the Department of Fisheries and Oceans (DFO) with advice and recommendations on the appropriate use of scientific evidence in risk-based aquaculture decision-making, the priority-setting process for aquaculture science at DFO, and the communication of aquaculture science and resulting decisions to Canadians."[6] The panel's mandate was fulfilled in December 2018 when the *Report of the Independent Expert Panel on Aquaculture Science* was presented to the Minister of Fisheries, Oceans and the Canadian Coast Guard and the Minister of Science and Sport.

**Precautionary approach**

In fisheries management, the precautionary approach is about "being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone action or failure to take action to avoid serious harm to fish stocks or their ecosystem. This approach is widely accepted as an essential part of sustainable fisheries management."[7]

**Recovery Potential Assessment**

After the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) "assesses an aquatic species as Threatened, Endangered, or Extirpated, Fisheries and Oceans Canada (DFO), as the responsible jurisdiction for aquatic species under the *Species at Risk Act* (SARA), undertakes several actions to support implementation of

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4 Fisheries and Oceans Canada, *External Advisory Committee on Aquaculture Science*; and Fisheries and Oceans Canada, *Government of Canada moves to strengthen science on aquaculture ensuring protection of wild fish stocks*, press release, 28 May 2019.

5 Government of Canada, *A Fishery Decision-Making Framework Incorporating the Precautionary Approach*.

6 Government of Canada, *Report of the Independent Expert Panel on Aquaculture Science*.

7 Government of Canada, *A Fishery Decision-Making Framework Incorporating the Precautionary Approach*.

SARA. Many of these actions require scientific information on the current status of the species, threats to its survival and recovery, and the species' potential for recovery. Formulation of this scientific advice has typically been developed through a Recovery Potential Assessment (RPA) following the COSEWIC assessment. This timing allows for the consideration of peer-reviewed scientific analyses within SARA processes, including the decision whether or not to list a species on Schedule 1, and during recovery planning if the species is listed."[8]

8 Fisheries and Oceans Canada, *Recovery Potential Assessment for Lower Fraser River White Sturgeon 2020*. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2021/011, 2021.

# LIST OF RECOMMENDATIONS

*As a result of their deliberations committees may make recommendations which they include in their reports for the consideration of the House of Commons or the Government. Recommendations related to this study are listed below.*

### Recommendation 45

**Given the perceived issues with the DFO's risk assessment of the impact of aquaculture operations in the Discovery Islands on wild fish stocks including:**

- **the failure to assess the cumulative impacts of the viruses and bacteria detected; and**

- **the suppression of additional research that could have had a material impact on the overall risk assessment,**

**that DFO submit to an independent review of the risk assessment, including but not limited to decisions on the assessment's terms of reference and factors that resulted in the suppression of research findings on the impact of sea lice and possibly other issues with a material impact on the health of wild fish stocks. That there be an independent audit and analysis to determine the accuracy and decision-informing value of the Science Advisory Report presented to the Minister of Fisheries, Oceans and the Canadian Coast Guard on DFO's risk assessment of aquaculture operations in the Discovery Islands..... 52**

### Recommendation 46

**That the Minister of Fisheries, Oceans and the Canadian Coast Guard provide in writing to the Committee a statement as to whether or not DFO omitted, canceled or in any other way did not complete or make unavailable a 10th CSAS risk assessment examining potential risks to Fraser sockeye..... 52**

### Recommendation 47

**That in light of new scientific revelations of potential impacts of *Tenacibaculum maritimum* and *Piscine orthoreovirus* (PRV) on wild Pacific salmon, the Government of Canada request that the Chief Science Advisor assess and make recommendations to the Minister of Fisheries, Oceans and the Canadian Coast Guard on the potential necessity for a CSAS assessment of risks posed by *Tenacibaculum maritimum* and PRV on all species of wild Pacific salmon, including Fraser sockeye..... 53**

# SCIENCE AT THE DEPARTMENT OF FISHERIES AND OCEANS

## INTRODUCTION

On 1 February 2022, the House of Commons Standing Committee on Fisheries and Oceans (the Committee) agreed to undertake a study to "examine how the Department of Fisheries and Oceans prioritizes, resources and develops scientific studies and advice for the department, how the results of scientific study are communicated to the Minister and Canadians, and how the minister applies data and advice provided by the department and other government departments to ministerial decisions."[1] The Committee heard from 57 witnesses over nine meetings held between 26 April 2022 and 7 October 2022.

During the study, the Committee heard from current and former Fisheries and Oceans Canada (DFO) employees, scientists, and representatives of Indigenous organizations, fishers and fisheries organizations, non-governmental organizations, and other stakeholders. These witnesses discussed the different elements involved in the formulation of science advice for decision-making including the collection and prioritization of scientific data within DFO, the Canadian Science Advisory Secretariat (CSAS) process used to generate peer-reviewed science advice, and the way science advice is provided to the Minister. The testimony heard by the Committee was somewhat polarized. Departmental officials told the Committee that DFO produces science advice for decision-making that is based on processes and policies that include collaboration and transparency and prevent conflicts of interest. However, other witnesses and stakeholders did not feel this was the case.

Witnesses agreed that DFO scientists do quality work. Dominique Robert, professor and Canada Research Chair in Fisheries Ecology at the Institut des sciences de la mer, Université du Québec à Rimouski, commended the quality of the work of DFO researchers and added that he believes they "are highly qualified to carry out the scientific work in their mandate."[2] The Committee heard that DFO has many good policies that outline the process to be followed during the development of science advice but that these policies were not being followed. Andrew Bateman, Manager,

1 House of Commons, Standing Committee on Fisheries and Oceans, *Minutes of Proceedings*, 1 February 2022.

2 Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology, Institut des sciences de la mer, Université du Québec à Rimouski, As an individual, *Evidence*, 5 May 2022.

Salmon Health at the Pacific Salmon Foundation, believed that "DFO's current science advice aims are laudable on paper, but principles and guidelines are only as good as their implementation."[3] Andrew Trites, Professor, Marine Mammal Research Unit, Institute for the Oceans and Fisheries at the University of British Columbia, stated that:

> Canada is recognized as a world leader in fisheries and oceans research, which reflects well on the productivity and quality of research done by DFO, universities and other groups. However, I think we fall short as a country in terms of doing science that matters to fishermen, coastal communities, tourist operators and fisheries managers, among others. I think a new approach is warranted to ensure that the fisheries and oceans research undertaken in the coming years addresses the concerns expressed by the different sectors that have a significant stake in the health of Canada's fisheries and marine ecosystems.[4]

## Policies and Guidelines for the Development of Science Advice Used in Decision-Making at Fisheries and Oceans Canada

At DFO, approximately 2,000 staff working at over 17 research institutes, laboratories and experimental centres are responsible for the production of scientific data, analysis, and advice.[5] The core role of science at DFO is to provide the evidence and data that will inform fisheries and oceans management decisions. For example, an important part of science at DFO is to support the fishing industry by providing stock assessment data which can feed into the eco-certification process completed by third parties that assess whether a fishery is well-managed and sustainable. Science staff at DFO also collaborate with international partners in research activities to support domestic and global policy-making.

DFO's CSAS coordinates the production of peer-reviewed assessments and science advice for departmental decision-makers. Figure 1 illustrates the process used by CSAS to generate science advice, which includes a peer review step.

3 Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

4 Andrew Trites, Professor, Marine Mammal Research Unit, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 14 June 2022.

5 Fisheries and Oceans Canada (DFO), "Science at DFO," *Machinery of Government*, 2021.

**Figure 1 : Canadian Science Advisory Secretariat Process at Fisheries and Oceans Canada**


Source: Fisheries and Oceans Canada, "Science Advice," *Machinery of Government*, 2021.

Pursuant to DFO policies, the participation of external experts in a CSAS process occurs by departmental invitation only. External experts are selected by a steering committee "based on their experience and expertise relevant to the subject matter of the review. Participants may include representatives of DFO, other government departments, First Nations, stakeholders, academia, environmental non-government organizations, as well

as international experts."[6] External experts have been invited to participate in the CSAS process since 1997.

The *Policy on Science Integrity*, which took effect in 2019, encourages "discussion based on differing interpretations of research and scientific evidence as a legitimate and necessary part of the research and scientific processes and, where appropriate, ensure[s] that these differences are made explicit and accurately represented."[7] The *Policy on Science Integrity* also aims to ensure that DFO "research and science and any research or scientific products, as well as any associated communications, are free from political, commercial, client and stakeholder interference."[8]

Mona Nemer, Chief Science Advisor at the Office of the Chief Science Advisor, explained that the *Policy on Science Integrity* is "meant to put in place the proper frameworks for the responsible conduct of research, including the ability of the scientists to publish their work without undue influence."[9] Arran McPherson, Assistant Deputy Minister of Ecosystems and Oceans Science at DFO, specified that although the Deputy Minister is responsible for the overall application of the *Policy on Science Integrity*, the Ombudsperson is responsible for managing any allegations of policy breaches.[10]

Different policies and guidelines based on the *Policy on Science Integrity*, such as the *Policy on Conflict of Interest in Science Peer Review Processes* and the *Policy on Participation in Science Peer Review Meetings*, are followed during the CSAS process. However, the Committee heard many witnesses describe elements of CSAS processes as problematic. They described the long delays encountered before getting a report on the detection of Piscine orthoreovirus (PRV) in farmed Chinook salmon published because of a disagreement between industry veterinarians and DFO staff on the interpretation of the data, the inclusion of particular interest groups in the CSAS process, and the use of consensus during the CSAS process as a suppression tactic. These examples are discussed in further detail later in this report.

6 DFO, *Understanding the Canadian Science Advisory Secretariat*.

7 DFO, *Policy on science integrity*.

8 Ibid.

9 Mona Nemer, Chief Science Advisor, Office of the Chief Science Advisor, *Evidence*, 26 April 2022.

10 Arran McPherson, Assistant Deputy Minister, Ecosystems and Oceans Science, DFO, *Evidence*, 7 October 2022.

## Communication of Scientific Information and Advice

Upon completion and approval, all CSAS process documents are to be made public on the CSAS website in accordance with DFO's *Policy on Distribution of Publications*. CSAS publications include:

- Research documents, which contain the supporting scientific information and analyses needed to generate advice;
- Science advisory reports, which contain scientific advice and outline the uncertainties and limitations of the advice;
- Proceedings, which document the discussions held during the peer review process and include a list of internal and external participants; and
- Science responses, which document the peer-reviewed scientific advice and proceedings for urgent and unforeseen requests for information or advice following the Science Special Response Process.[11]

While DFO recognizes the role of researchers and scientists in communicating information to the public, the *Policy on Science Integrity* states that there may be "legitimate and compelling reasons that may limit the disclosure or availability of research or scientific information to employees, stakeholders or the public."[12] Examples of legitimate and compelling reasons given by the policy include "the need for caution and prudence in the public communication of classified or sensitive scientific or research information, as well as existing legal constraints on information disclosure".[13] However, the policy also mentions that DFO researchers and scientists "have the right, and are encouraged, to speak about or otherwise express themselves on science and their research without approval or pre-approval [from their managers or supervisors] and without being designated as an official spokesperson."[14]

## Ministerial Decision-Making for Fisheries Management

Although ministerial decisions may be informed by science advice, pursuant to section 2.5 of the *Fisheries Act*, the Minister may also consider factors such as

11 DFO, *Policy on Publication of Non-CSAS Documents on the CSAS Website*.

12 DFO, *Policy on science integrity*.

13 Ibid.

14 Ibid.

community knowledge, Indigenous knowledge, and social, economic, and cultural issues.[15] Ministerial decisions must, however, respect conservation principles, legally-binding agreements, and Aboriginal rights and treaty rights.[16] Regarding fisheries management, the Minister of Fisheries, Oceans and the Canadian Coast Guard, pursuant to the *Fisheries Act*, has the authority to determine, among other responsibilities:

- the annual total allowable catch (TAC) of a species or stock;
- fisheries licence conditions;
- the times and seasons for fishing; and
- restrictions to be imposed (e.g., gear type, dockside or at-sea monitoring, reporting requirements).

Bernard Vigneault, Director General of the Ecosystem Science Directorate at DFO, summarized the production of science advice at DFO as follows:

> As a science-based department, science integrity is essential to the work of the department and its employees. Science integrity is critical to the decision-making process, from the planning and conduct of research to the production and the application of advice. Departmental scientists are bound by our code of ethics and values, and our science integrity policy, which reinforces principles such as transparency, scientific excellence and ensuring high standards of research ethics.
>
> DFO generates science advice in a transparent way, using the Canadian Science Advisory Secretariat, which is based on the principle of evidence-based peer review. Participants in the peer review process participate as objective experts to complete the peer review of the science under consideration. To guide participation, DFO has published a conflict of interest policy and a policy on participation for the CSAS meetings.[17]

During the study, witnesses described various stages during the development of advice for decision-makers where scientific information could be blocked or modified, such as during the CSAS process or as the information was being prepared to be communicated to the Minister. For example, Alexandra Morton, Independent Scientist (as an individual), described a situation where DFO management briefed representatives of the aquaculture industry but did not brief the Minister about the risk posed to young Fraser sockeye by *Tenacibaculum maritimum* after having been alerted to the risk by DFO

15 *Fisheries Act*, R.S.C., 1985, F-14.

16 DFO, *Fisheries management decision-making*.

17 Bernard Vigneault, Director General, Ecosystem Science Directorate, DFO, *Evidence*, 26 April 2022.

scientists.[18] Robert Chamberlin, chairman of the First Nations Wild Salmon Alliance, believed that the aquaculture industry had been much too involved in the CSAS process related to open-net cage fish farms for it to be objective.[19] Witnesses also described issues with DFO's data collection, which is the foundation for all the department's science advice.

## THE COLLECTION OF SCIENTIFIC DATA AND THE PRODUCTION OF SCIENTIFIC PRODUCTS BY FISHERIES AND OCEANS CANADA

Bernard Vigneault described the collection of scientific data and the production of scientific products at DFO as follows:

> Each year, DFO science mobilizes teams of research scientists, biologists and technicians to conduct field and laboratory studies for hundreds of distinct projects in marine and freshwater systems. This results in a wealth of knowledge about our ecosystems and fish populations to support the departmental decision-making. The science sector has expertise in a wide range of fields, including marine environment and aquatic ecosystems, hydrography, oceanography, fisheries, aquaculture and biotechnology. DFO science is made up of science professionals located in research institutes, laboratories, experimental centres and offices across the country. Science staff collect data and conduct research and monitoring activities, the results of which contribute to the science advice that can be used to answer specific questions or to inform decisions.[20]

DFO uses an ecosystem science approach. Greig Oldford, PhD Candidate and Scientist at the University of British Columbia (as an individual), defines this approach "as a broad approach to studying relationships and interactions in the ecosystem, and it integrates science outputs. We prioritize and try to understand the key relationships in nature and their links to human needs and management actions."[21] Dominique Robert recommended accelerating the implementation of an ecosystem approach to fisheries management in Canada, noting that a 2019 CSAS report concluded that less than half of the 178 stock assessments reviewed considered ecosystem aspects.[22] He believed that if "we want to offer better scientific advice with an ecosystem approach to management, but there is a

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18 Alexandra Morton, Independent Scientist, As an individual, *Evidence*, 12 May 2022.

19 Robert Chamberlin, Chairman, First Nation Wild Salmon Alliance, *Evidence*, 12 May 2022.

20 Bernard Vigneault, Director General, Ecosystem Science Directorate, DFO, *Evidence*, 26 April 2022.

21 Greig Oldford, PhD Candidate and Scientist, University of British Columbia, As an individual, *Evidence*, 5 May 2022.

22 Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology, Institut des sciences de la mer, Université du Québec à Rimouski, As an individual, *Evidence*, 5 May 2022.
See: Pepin, P., *et al*., *Incorporating climate, oceanographic and ecological change considerations into population assessments: A review of Fisheries and Oceans Canada's science advisory process*, 2019.

lack of certain crucial components of the ecosystem, such as forage species, it will be difficult to achieve this."[23] Keith Sullivan, President of Fish, Food and Allied Workers - Unifor, agreed that the use of an ecosystem approach was appropriate but emphasized the need to consider all elements of the ecosystem, including predators such as seals.[24] Mona Nemer explained that climate change is changing different conditions in the ocean, including the temperature, salinity and acidity of the water.[25] Dominique Robert believed the "rapid ecosystem changes we are currently experiencing because of global warming also require the consideration of ecosystem variables in stock assessments to ensure sustainable management of our resources."[26]

**Recommendation 1**

**That the Ocean science activities of the Department of Fisheries and Oceans (DFO) prioritize a comprehensive research strategy to determine the current and estimated future impacts of climate change on marine life and provide regular public updates on findings.**

**Recommendation 2**

**That the Government of Canada request that the Chief Science Advisor examine how and to what degree DFO has deployed an ecosystem-based approach for stock management and recovery, and, if necessary, make recommendations on how DFO may better implement ecosystem-based fisheries management.**

**Recommendation 3**

**That DFO speed up the implementation of an ecosystem-based approach to fisheries management in Canada given the impact of climate change.**

Witnesses mentioned the importance of cooperation within the federal government as well as with different stakeholder groups and associations, including industry, Indigenous groups, universities and citizen anglers, to maximize the data available. Jean Côté, Scientific Director at the Regroupement des pêcheurs professionnels du sud de la Gaspésie, described the Lobster Group (or Lobster Node) as "a group of fishers'

23 Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology, Institut des sciences de la mer, Université du Québec à Rimouski, As an individual, *Evidence*, 5 May 2022.

24 Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022.

25 Mona Nemer, Chief Science Advisor, Office of the Chief Science Advisor, *Evidence*, 26 April 2022.

26 Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology, Institut des sciences de la mer, Université du Québec à Rimouski, As an individual, *Evidence*, 5 May 2022.

associations from the five Atlantic provinces. Government researchers from DFO, a provincial ministry, as well as university researchers" that "conducts studies and fills the gaps in our knowledge about the productivity, structure and connectivity of lobster stocks in their distribution area" through collaborative study.[27] Andrew Trites believed a "collaborative research program overseen by fishermen, academics and government scientists," such as the Canadian Fisheries Research Network which existed between 2010 and 2015, would be a good way to address many of the concerns raised about science at DFO.[28] Brian E. Riddell, Science Advisor at the Pacific Salmon Foundation, reminded the Committee that citizen science can be a powerful data collection tool.[29] Witnesses also mentioned the importance of collaborating with the United States when working on transboundary species such as wild Pacific salmon or Atlantic mackerel.[30]

**Recommendation 4**

**That Canada increase collaboration with our international allies and neighbors for stock assessments and scientific research for all transboundary species.**

Kathryn Moran, President and Chief Executive Officer at Ocean Networks Canada, described the Sea Grant program in the United States where regional funding is directed towards the interests of fishers and the "science they need to help them advance their economic benefit."[31] She suggested this could be a model to consider in Canada.

Dr. Kristi Miller-Saunders explained that funding within DFO is "largely based on competitive proposals."[32] She told the Committee that she anticipated funding under the Pacific Salmon Strategy Initiative but had yet to receive any. Her research program on pathogens, environmental stress and climate change is funded "principally through money [from] outside of the department" because of better success in generating funds to do the research with outside granting agencies than from within DFO.[33]

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27 Jean Côté, Scientific Director, Regroupement des pêcheurs professionnels du sud de la Gaspésie, *Evidence*, 2 June 2022.

28 Andrew Trites, Professor, Marine Mammal Research Unit, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 14 June 2022.

29 Brian E. Riddell, Science Advisor, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

30 Rebecca Reid, Regional Director General, Pacific Region, DFO, *Evidence*, 7 October 2022; and Christopher Jones, Senior Fisheries Manager, Department of Fisheries and Oceans (Retired), As an individual, *Evidence*, 14 June 2022.

31 Kathryn Moran, President and Chief Executive Officer, Ocean Networks Canada, *Evidence*, 5 May 2022.

32 Dr. Kristi Miller-Saunders, Senior Research Scientist, DFO, *Evidence*, 26 April 2022.

33 Ibid.

**Recommendation 5**

**That the Minister of Fisheries, Oceans and the Canadian Coast Guard direct departmental officials to immediately initiate a review of DFO allocations for science to ensure departmental resources are available for the scientific work in both fisheries and ocean science that is required to inform decisions of DFO and Minister and likewise ensure that DFO scientists are not dependant on external funding streams to complete their work.**

## Stock Assessments

In fisheries management, the precautionary approach means "being cautious when scientific information is uncertain, unreliable or inadequate and not using the absence of adequate scientific information as a reason to postpone or fail to take action to avoid serious harm to the resource."[34] Sufficient and timely data is therefore important because the quality of recommendations made to decision-makers depends on the data available. Robert Chamberlin believed the precautionary approach requires the removal of fish farms from coastal British Columbia.[35]

Witnesses expressed concern that a lack of capacity and resources within DFO, as well as competing priorities between oceans and fisheries sciences, could mean that some stock assessments or surveys cannot be completed in a timely manner. Adam Burns, Acting Assistant Deputy Minister of Fisheries and Harbour Management at DFO, stated that decisions for stock assessments "are informed by the best available science" even in cases when the science might have been done prior to the year in question.[36] According to Christina Burridge, Executive Director at the BC Seafood Alliance, if stock assessments are not timely, "TACs may be more precautionary than necessary, meaning benefits to Canadians are constrained."[37] Kris Vascotto, Executive Director of the Atlantic Groundfish Council and Carey Bonnell, Vice-President, Sustainability and Engagement at Ocean Choice International L.P., expressed dismay at delayed stock assessments.[38]

Given the "ongoing challenges in most DFO regions in getting the science programs delivered," Morley Knight, retired Assistant Deputy Minister of Fisheries Policy at DFO

34 DFO, *A fishery decision-making framework incorporating the precautionary approach*.

35 Robert Chamberlin, Chairman, First Nation Wild Salmon Alliance, *Evidence*, 12 May 2022.

36 Adam Burns, Acting Assistant Deputy Minister, Fisheries and Harbour Management, DFO, *Evidence*, 7 October 2022.

37 Christina Burridge, Executive Director, BC Seafood Alliance, *Evidence*, 2 June 2022.

38 Kris Vascotto, Executive Director, Atlantic Groundfish Council, *Evidence*, 21 June 2022; and Carey Bonnell, Vice-President, Sustainability and Engagement, Ocean Choice International L.P., *Evidence*, 21 June 2022.

(as an individual), believed that "[t]hose responsible should be held accountable to make sure that the surveys are done and that DFO science gets top priority. When it doesn't get delivered, those who were responsible should be held accountable."[39]

Charlotte K. Whitney, Program Director of Fisheries Management and Science at the Central Coast Indigenous Resource Alliance, questioned how DFO prioritizes stock assessments given that "many targeted and bycatch stocks have outdated assessments or no assessment at all."[40] Given that 80% of stocks have no fishing mortality estimates, Robert Rangeley, Director of Science at Oceana Canada, hoped that DFO would address inconsistencies in catch monitoring by fully implementing the fishery monitoring policy.[41]

Christopher Jones, retired Senior Fisheries Manager at DFO (as an individual), explained that in the Maritimes region, scientific effort had been focused on certain high-profile stocks such as crab, lobster and halibut because of limited resources. Fisheries that are not high profile receive "very little to practically no science support" in the two-tier system.[42] Dominique Robert explained that, more generally,

> the quality of available data varies greatly between stocks. The assessment of some historically and culturally important species, such as Atlantic cod in eastern Canada, relies on high quality data from multiple sources. Other stocks, however, such as forage species, are data poor. Basic measures, such as their spawning biomass, are sometimes unknown. The quality of the recommendations that scientists can make is therefore directly dependent on the data available.[43]

Morley Knight believed that when there is greater uncertainty about the status of a particular stock, "there has to be a redoubling of efforts to find out the real truth and be more certain about what the real situation is."[44] He suggested that could be the case with the Atlantic mackerel.

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39 Morley Knight, Former Assistant Deputy Minister, Fisheries Policy, Department of Fisheries and Oceans (Retired), as an individual, *Evidence*, 7 October 2022.

40 Charlotte K. Whitney, Program Director, Fisheries Management and Science, Central Coast Indigenous Resource Alliance, *Evidence*, 28 April 2022.

41 Robert Rangeley, Director of Science, Oceana Canada, *Evidence*, 14 June 2022.

42 Christopher Jones, Senior Fisheries Manager, Department of Fisheries and Oceans (Retired), As an individual, *Evidence*, 14 June 2022.

43 Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology, Institut des sciences de la mer, Université du Québec à Rimouski, As an individual, *Evidence*, 5 May 2022.

44 Morley Knight, Former Assistant Deputy Minister, Fisheries Policy, Department of Fisheries and Oceans (Retired), As an individual, *Evidence*, 7 October 2022.

Melanie Giffin, Marine Biologist and Program Planner at the Prince Edward Island Fishermen's Association, emphasized that the collection of field and at-sea data necessary for stock assessments is crucial and that funding for these activities must be ensured. She suggested that this data could be collected by DFO or by industry on behalf of DFO.[45] Kathryn Moran suggested that DFO could make use of autonomous surface vehicles to complete stock assessments.[46]

Dominique Robert believed that a limitation for collecting new data is aging Canadian Coast Guard (CCG) vessels, which are already in such high demand for existing surveys that finding the time to repair them is difficult.[47] Kris Vascotto and Carey Bonnell agreed and suggested that more resources be directed to this issue.[48] Arran McPherson told the Committee that three new dedicated CCG fisheries vessels have recently transitioned into service.[49]

**Recommendation 6**

**That DFO conduct an internal audit on the performance of new research vessels to ensure the suitability of new vessels to maintain and improve the DFO's ability to conduct stock assessments, and that the results of this audit be communicated to the House of Commons Standing Committee on Fisheries and Oceans.**

Witnesses also discussed the ability of departmental officials to complete all the required data analysis. Kris Vascotto worried "[r]ecent staffing efforts focused on populating new programs have resulted in a drain from existing ones. This means more vacancies in key stock assessment positions and gaps in analytical capacity."[50] Robert Rangely suggested that DFO might have a difficult time meeting the timelines of Canada's new stock rebuilding regulations.[51] Christopher Jones wondered what impact the attribution of physical and human resources to monitoring protected areas would

45 Melanie Giffin, Marine Biologist and Program Planner, Prince Edward Island Fishermen's Association, *Evidence*, 2 June 2022.

46 Kathryn Moran, President and Chief Executive Officer, Ocean Networks Canada, *Evidence*, 5 May 2022.

47 Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology, Institut des sciences de la mer, Université du Québec à Rimouski, As an individual, *Evidence*, 5 May 2022.

48 Kris Vascotto, Executive Director, Atlantic Groundfish Council, *Evidence*, 21 June 2022; and Carey Bonnell, Vice-President, Sustainability and Engagement, Ocean Choice International L.P., *Evidence*, 21 June 2022.

49 Arran McPherson, Assistant Deputy Minister, Ecosystems and Oceans Science, DFO, *Evidence*, 7 October 2022.

50 Kris Vascotto, Executive Director, Atlantic Groundfish Council, *Evidence*, 21 June 2022.

51 Robert Rangeley, Director of Science, Oceana Canada, *Evidence*, 14 June 2022.

have on the department's ability to undertake stock assessments.[52] Christina Burridge worried that stock assessments necessary to meet the conditions necessary to obtain a Marine Stewardship Council (MSC) certification could be delayed in favour of regulatory or legislative requirements, such as those under the *Species at Risk Act*, due to a lack of sufficient staff.[53] The Fisheries Council of Canada stated in its brief that delays in stock assessments can lead to fisheries losing their MSC certifications.[54] Kris Vascotto emphasized the importance of mentorship opportunities for newer staff within DFO as well as staff retention policies to develop and keep stock assessment knowledge within the department.[55]

Carey Bonnell expressed concern that, "even though demands for government-required rebuilding plans, as well as sustainability certification supports" have grown in the last few years, recent investments in DFO science

> have primarily been to support ocean science—such as funding to support marine conservation targets, marine mammal research, etc.—as opposed to its capacity and expertise for commercial stock assessments. While investment in ocean science is critical to monitor the health of our oceans, it is high-quality stock assessment science that ensures the sustainable and optimal utilization of Canada's fish stocks.[56]

Martin Mallet, Executive Director of the Maritime Fishermen's Union, suggested that DFO stock assessments be adapted and properly funded to reflect a "rapidly changing ecosystem associated with climate change."[57]

**Recommendation 7**

**That DFO allocate sufficient resources, including sufficient at-sea capabilities, to conduct timely and comprehensive stock assessments and acoustic surveys for all commercial fish species.**

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52 Christopher Jones, Senior Fisheries Manager, Department of Fisheries and Oceans (Retired), As an individual, *Evidence*, 14 June 2022.

53 Christina Burridge, Executive Director, BC Seafood Alliance, *Evidence*, 2 June 2022.

54 Fisheries Council of Canada, "Science at the Department of Fisheries and Oceans," Written submission to the House of Commons Standing Committee on Fisheries and Oceans, 31 August 2022.

55 Kris Vascotto, Executive Director, Atlantic Groundfish Council, *Evidence*, 21 June 2022.

56 Carey Bonnell, Vice-President, Sustainability and Engagement, Ocean Choice International L.P., *Evidence*, 21 June 2022.

57 Martin Mallet, Executive Director, Maritime Fishermen's Union, *Evidence*, 9 June 2022.

**Recommendation 8**

**Considering that DFO's scientific models used for stock assessments rely on data from surveys, the Committee recommends that greater emphasis be placed on completing surveys and robust data acquisition, even when vessels break down or are unavailable. That DFO do this by fostering relationships with the fishing industry to utilize commercial fishing license holders and vessels to supplement DFO scientific data collection.**

**Recommendation 9**

**That, in order to ensure stock assessment surveys are completed, DFO identify and use opportunities that exist for harvester data to be included in stock assessment activities, thereby contributing to collaborative and citizen science.**

**Recommendation 10**

**That DFO immediately implement, in partnership with academic and industry scientists, a review of the criteria for the selection of survey areas to consider variability in stock distributions as well as harvester observations in order to have a more realistic view of the status of fish stocks and fishing pressure. These stock surveys should take place twice a year.**

**Recommendation 11**

**Given the importance of a sustainable fishery on the economic and social health of small, coastal communities and our obligations toward Indigenous reconciliation, that DFO prioritize completing regular and thorough stock assessments on all three coasts and commit to timely and fulsome community and stakeholder engagement on proposed fishing restrictions to protect fish stocks and marine species threatened or at risk.**

**Recommendation 12**

**That DFO commit to more timely decision-making to provide certainty to fish harvesters and industries impacted by fisheries decisions. This would ensure that those impacted, whether positively or negatively by these decisions have enough time to prepare and react to the changes and will ensure that government can provide support for those industries negatively impacted by fishery closures.**

**Recommendation 13**

**That DFO review the allocation of its resources, financial and otherwise, between ocean science and fisheries science to**

- **ensure sufficient funding for the stock assessments required for sound management, eco certifications and rebuilding plans required to restore depleted stocks; and**

- **reflect the commercial, social, and cultural importance of fisheries in coastal communities.**

**Recommendation 14**

**That DFO introduce an annual Report to Parliament on the status of fish stocks, staffing levels and expenditures by program area, and fisheries management performance in a publicly available report to enable transparency of evidence used for ministerial decision-making, including any pertinent decision notes.**

**Recommendation 15**

**That the Minister of Fisheries, Oceans and the Canadian Coast Guard immediately direct departmental officials to provide the Committee on an annual and ongoing basis with documentation containing tables reflecting how many fishery stocks DFO manages, how many stocks have and have not been assessed in the current year, and what actions the Minister will commit to ensure resources and direction are provided to increase stock assessments starting in 2023 as an annual exercise.**

## Modelling

Greig Oldford told the Committee that "simulation modelling and computer modelling [do] play an outsized role in marine ecology."[58] He added that it isn't easy to navigate uncertainty in modelling, especially in marine ecology since variables can't be isolated in controlled experiments and long-term data series are not always available.[59] Andrew Trites explained that an aspect of modelling that is often overlooked is the degree of certainty of a model (i.e., how likely a particular outcome is). He added that a higher certainty (such as 80%) is likely preferred for big decisions and that a lower certainty (say 30% to 40%) could be enough for decisions where what is at stake is not considered to be of high value.[60]

58 Greig Oldford, PhD Candidate and Scientist, University of British Columbia, As an individual, *Evidence*, 5 May 2022.

59 Ibid.

60 Andrew Trites, Professor, Marine Mammal Research Unit, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 14 June 2022.

Christopher Jones told the Committee that over the past several years, it seemed as though "DFO has updated most of its stock assessment models, which for the most part have resulted in decreasing assessments."[61] He wondered why the models had been updated at this time, if the models were updated to take an approach more focused on conservation, which parameters had been updated and to what extent, and whether the models had been modified to more closely resemble Scandinavian stock assessment models. He described the impact of the new model on the halibut stock assessment, a fishery that "has been solid on the Atlantic coast for years," as follows:

> The population has recovered under the existing models. This has created questions. If the existing model was either inadequate or flawed, how could the halibut population thrive using it? What was the rationale for changing the model if the model may not have been flawed? The new model suggests reducing the quota by 13%. Is this an indicator of increased accuracy within the new model, or has the model been adjusted to reflect the enhanced conservation objectives? If not, is there an accuracy threshold that the new assessment modelling is striving to achieve?[62]

Jesse Zeman, Executive Director, B.C. Wildlife Federation, described how DFO management, not DFO science, developed a model for the period where interior Fraser steelhead move through the Fraser River. While this model "was rejected through the peer review process," Mr. Zeman stated that "DFO management is still using this rejected model to brief the minister."[63]

Jean Côté told the Committee about to a novel artificial intelligence model that uses "post-season data collected over the last 10 years to predict the evolution of stocks and catches" that his organization had developed with a private company rather than in collaboration with DFO because of a lack of availability from the relevant DFO official.[64]

**Recommendation 16**

**That the current DFO modelling used for stock assessments be changed to allow for fisher data input and that the DFO modelling should be reviewed in the European stock assessment modelling concept.**

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61 Christopher Jones, Senior Fisheries Manager, Department of Fisheries and Oceans (Retired), As an individual, *Evidence*, 14 June 2022.

62 Ibid.

63 Jesse Zeman, Executive Director, B.C. Wildlife Federation, *Evidence*, 28 April 2022.

64 Jean Côté, Scientific Director, Regroupement des pêcheurs professionnels du sud de la Gaspésie, *Evidence*, 2 June 2022.

## THE DEVELOPMENT OF SCIENCE ADVICE THROUGH THE CANADIAN SCIENCE ADVISORY SECRETARIAT

The Committee heard many witnesses describe what they believed were shortcomings within the CSAS process, including potential conflicts of interest for participants to the CSAS process and the use of consensus to stifle opposing views. Witnesses including Jeffery Young, Senior Science and Policy Analyst at the David Suzuki Foundation, Greg Taylor, Consultant and Fisheries Advisor at the Watershed Watch Salmon Society, and Andrew Bateman told the Committee that DFO's processes are good in theory but not in practice.[65] Robert Chamberlin suggested that "CSAS is a shining example of the environment within DFO that needs to be meticulously analyzed and restored back to its original mandate—namely, the mandate of actually working to protect the environment and wild fish for Canadians."[66] Jeffery Young stated that "the process for DFO decision-making is broken, and science is at the middle of this failure, or, more concerningly, is being pushed to the side."[67]

While most witnesses agreed that there were issues with at least some elements of the CSAS process, they suggested differing levels of necessary intervention. Alexandra Morton suggested the formation of a "a non-government board of scientists to monitor DFO's response to science."[68] John Reynolds suggested that DFO could "adopt a prime directive where management objectives are expressly prohibited from influencing science, and there could be checks and balances along the way to ensure that is occurring."[69] Jesse Zeman proposed a "full restart" in order to "separate DFO management from DFO science."[70]

### Composition of Groups Involved in Canadian Science Advisory Secretariat Processes

DFO's *Policy on Conflict of Interest in Science Peer Review Processes* was implemented in 2021. The policy "directly addresses the importance of objective science, free from

65 Jeffery Young, Senior Science and Policy Analyst, David Suzuki Foundation, *Evidence*, 14 June 2022; Greg Taylor, Consultant and Fisheries Advisor, Watershed Watch Salmon Society, *Evidence*, 28 April 2022; and Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

66 Robert Chamberlin, Chairman, First Nation Wild Salmon Alliance, *Evidence*, 12 May 2022.

67 Jeffery Young, Senior Science and Policy Analyst, David Suzuki Foundation, *Evidence*, 14 June 2022.

68 Alexandra Morton, Independent Scientist, As an individual, *Evidence*, 12 May 2022.

69 John Reynolds, Chair, Committee on the Status of Endangered Wildlife in Canada, *Evidence*, 5 May 2022.

70 Jesse Zeman, Executive Director, B.C. Wildlife Federation, *Evidence*, 28 April 2022.

political, commercial and client interference."[71] According to Arran McPherson, who is the DFO official responsible for the policy, the conflict of interest policy "codified what was already a best practice in many of our CSAS processes across the country, and codified that participants who come to our meetings are in fact there as impartial experts bringing their expertise and not a consideration of the impacts of decisions."[72] She further explained that the chair of individual CSAS processes is "responsible for ensuring that the conflict of interest policies are respected throughout the process."[73] Bernard Vigneault described peer review as a "vital component of the important challenge function that the DFO science sector provides" with the objective of providing "sound, objective and impartial science information and advice."[74]

Witnesses expressed apprehension about the composition of some the panels and tables in CSAS processes, worrying that the presence of a particular interest group could skew the conclusions reached. For example, Keith Sullivan, Martin Mallet, Jean Lanteigne, Director General of the Fédération régionale acadienne des pêcheurs professionnels, and Kris Vascotto spoke of the presence of environmental non-governmental organizations at fisheries advisory tables.[75] Various witnesses also spoke about the presence of the fish farming industry during CSAS processes related to aquaculture and wild Pacific salmon. These examples are presented in an upcoming section.

Jeffery Young proposed that "[s]takeholder tables and even technical working groups formed by DFO have largely served to reposition DFO as an arbiter between interests rather than a regulator and upholder of good science and evidence-based information."[76]

However, not all the witnesses believed that undue influence was being exerted by participants in CSAS processes. The experience of Josh Korman, Fisheries Scientist at Ecometric Research Inc., with the CSAS process led him to believe that the review

71 Government of Canada, *Canadian Science Advisory Secretariat, Policy on Conflict of Interest in Science Peer Review Processes*.

72 Arran McPherson, Assistant Deputy Minister, Ecosystems and Oceans Science, DFO, *Evidence*, 7 October 2022.

73 Ibid.

74 Bernard Vigneault, Director General, Ecosystem Science Directorate, DFO, *Evidence*, 26 April 2022.

75 Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022; Martin Mallet, Executive Director, Maritime Fishermen's Union, *Evidence*, 9 June 2022; Jean Lanteigne, Director General, Fédération régionale acadienne des pêcheurs professionnels, *Evidence*, 9 June 2022; and Kris Vascotto, Executive Director, Atlantic Groundfish Council, *Evidence*, 21 June 2022.

76 Jeffery Young, Senior Science and Policy Analyst, David Suzuki Foundation, *Evidence*, 14 June 2022.

process of working papers is actually "quite rigorous," and he had "not observed that unsupported bias from DFO fisheries management or outside parties have unduly influenced CSAS working papers or their final versions."[77]

**Recommendation 17**

**That DFO conduct robust peer reviewed, non-biased science with academic organizations and include both harvesters' knowledge and Indigenous traditional knowledge.**

**Recommendation 18**

**That the Government of Canada initiate an independent audit of how and to what degree DFO has implemented their science integrity policy and that the resulting audit report be tabled in the House of Commons in 2023.**

## Use of Consensus during the Canadian Science Advisory Secretariat Process

Regarding the consensus needed to formulate science advice during the CSAS process, DFO documentation notes that:

> [i]n cases where there are two or more equally reasonable conclusions, the peer review may apply a "weight of evidence" approach to clarify which is most strongly backed by current available scientific evidence. Strongly opposing opinions or viewpoints may be noted in the record of proceedings.[78]

Witnesses who had participated in CSAS meetings questioned the atmosphere at these meetings. Michael Dadswell, retired professor of biology at Acadia University (as an individual) shared that, based on his experience at more than 20 CSAS meetings, "differing opinions on data and conclusions that are contradictory to DFO policy and unsanctioned by CSAS are most often totally unwelcome and usually ignored."[79] Andrew Bateman explained that "consensus is held up as a strength of CSAS, but meetings apply strong social pressure on dissenting voices […]. There is no mechanism for errors to be addressed once the consensus box has been ticked."[80] He added that:

77 Josh Korman, Fisheries Scientist, Ecometric Research Inc., *Evidence*, 5 May 2022.

78 DFO, *Understanding the Canadian Science Advisory Secretariat*.

79 Michael Dadswell, Retired Professor of Biology, Acadia University, As an individual, *Evidence*, 12 May 2022.

80 Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

> In any case, consensus is not a requirement of the scientific process, and the practice of minimizing real disagreement does a disservice to decision-makers and flies in the face of the SAGE guidelines that state that decision-makers should consider the multiple viewpoints received, not just the distilled version of uncertainty used in practice.[81]

Brian Riddell, Science Advisor at the Pacific Salmon Foundation, argued that forcing consensus was a disservice to the Minister since they have "the responsibility to understand the uncertainties, as well. That's where the management of policy comes into play, not in the science."[82]

Arran McPherson clarified that DFO defines consensus as "'absence of evidence-based opposition'. It's not enough to disagree. There needs to be evidence that's brought forward to support the point of view that's being made at the meeting itself." She added that the possibility to make note of "perspectives or issues that did not arrive at consensus" does exist within the CSAS process and is left to the discretion of the chair. She explained that it was an element that could be used more often.[83]

Examples of the use of consensus during the CSAS process in the context of wild Pacific salmon are discussed in an upcoming section.

## Transparency and Communication of Scientific Information

Bernard Vigneault stated that the results of peer reviews and the supporting analyses are

> published on the department's website. These scientific analyses inform departmental decision-making and provide Canadians with the scientific analyses and advice generated by the departmental science staff. DFO also supports open science, has an action plan and continues to publish data, including through the open government data portals. All DFO science reports are open and accessible.[84]

Jeffery Young described the importance of the transparent scientific communication as follows:

> Our challenge today is a lack of accountability built on a foundation of transparent, evidence-based reporting. Science needs to be recentred in the decision-making

81 Ibid.

82 Brian E. Riddell, Science Advisor, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

83 Arran McPherson, Assistant Deputy Minister, Ecosystems and Oceans Science, DFO, *Evidence*, 7 October 2022.

84 Bernard Vigneault, Director General, Ecosystem Science Directorate, DFO, *Evidence*, 26 April 2022.

> structure, while we ensure that it is adequately transparent and independent of political interference. It is appropriate for the political decision-makers to weigh multiple considerations, but it is critical that science advice and information be as objective as possible and be made available to the public.[85]

Witnesses were dissatisfied with the amount of publicly available information. Robert Rangely told the Committee that less than 10% of science publications are released on time despite the CSAS policy to "ensure transparency and timely dissemination of publications." He added that

> the most relevant science advice was often not publicly available until after the decision was made and communicated. As a result, and despite the government's intention to promote public transparency and policy engagement, decision-making in DFO may be based too frequently on a flawed or limited understanding of the underlying scientific evidence.[86]

Many witnesses shared examples of scientific information related to wild Pacific salmon seemingly being suppressed or altered at different stages of the CSAS process before being communicated to the Minister or made available to the public. Examples of difficulty gaining access to information, apparent changes in research plans to avoid troublesome results and inappropriate interpretation of CSAS documents are presented in an upcoming section.

**Recommendation 19**

**That DFO improve the transparency of data and research by developing a portal to publish the detailed studies, including the scientific and socio-economic impact documentation, that are the inputs into the CSAS and COSEWIC processes. This portal should be easy to navigate and include both raw data and summaries free of scientific or bureaucratic jargon so that all Canadians, and fishers in particular, can understand the findings.**

**Recommendation 20**

**Make all scientific data produced by DFO publicly available for peer review from researchers outside of the Department.**

85 Jeffery Young, Senior Science and Policy Analyst, David Suzuki Foundation, *Evidence*, 14 June 2022.

86 Robert Rangeley, Director of Science, Oceana Canada, *Evidence*, 14 June 2022.

## INDIGENOUS INVOLVEMENT

Aidan Fisher, Biologist at the Lower Fraser Fisheries Alliance, and Greg Taylor described a desire for the increased involvement of Indigenous peoples in the development of scientific conclusions as well as the field and lab work necessary to develop them.[87] Michael Staley, Biologist at the Fraser Salmon Management Council, explained that support to develop the scientific and technical capabilities of First Nations would enable them to take up their role in the co-management of fish and fisheries resources with DFO.[88]

Carey Bonnell suggested that Indigenous knowledge and Indigenous stakeholders "deserve a seat at the table, and direct representation and input into the decision-making process."[89]

The role of Indigenous knowledge in the development of science advice was discussed. Witnesses expressed hope that traditional knowledge would be better incorporated into DFO's scientific activities and conclusions. The Committee heard that it is currently only applied as a small part of the peer review process and often not applied in the final recommendations. Charlotte K. Whitney explained that "Indigenous knowledge often has longer baselines and superior understanding of local ecosystems than western science does and, therefore, should be treated as the valid knowledge system that it is."[90]

Alejandro Frid, Science Coordinator at the Central Coast Indigenous Resource Alliance, gave the Committee an example of the longer baselines of Indigenous knowledge and how they can benefit the development of science advice. He described an analysis of data that showed "very rapid declines in the size and age structure of yelloweye rockfish."[91] The DFO survey data from 2003 to 2015 showed a "decline of about half a centimetre per year in the average size of yelloweye rockfish and an average decline of about 10 months per year in the average age of yelloweye rockfish."[92] Since larger females are more fecund than smaller females per unit of body size, Alejandro Frid

87 Aidan Fisher, Biologist, Lower Fraser Fisheries Alliance, *Evidence*, 2 June 2022; and Greg Taylor, Consultant and Fisheries Advisor, Watershed Watch Salmon Society, *Evidence*, 28 April 2022.

88 Michael Staley, Biologist, Fraser Salmon Management Council, *Evidence*, 28 April 2022.

89 Carey Bonnell, Vice-President, Sustainability and Engagement, Ocean Choice International L.P., *Evidence*, 21 June 2022.

90 Charlotte K. Whitney, Program Director, Fisheries Management and Science, Central Coast Indigenous Resource Alliance, *Evidence*, 28 April 2022.

91 Alejandro Frid, Science Coordinator, Central Coast Indigenous Resource Alliance, *Evidence*, 28 April 2022.

92 Ibid.

explained that this has tremendous implications for fecundity. He further explained that DFO's data collection started in 2003, after the commercial fisheries had already cause declines in yelloweye rockfish.

> Looking at indigenous knowledge through structured interviews, we reconstructed the body sizes of yelloweye going back to the 1950s or so and how, in the catches of indigenous fishers, those sizes changed over time. Between 1980—which is before any of these scientific surveys had begun—and 2000, we see a decline of nearly half the average size. If we only look at the scientific data, we will have a shifting baseline of what would have been considered normal. It would be starting in 2003, which is about half the body size and disproportionally lower fecundity that was there before the commercial fisheries got under way.[93]

Robert Chamberlin emphasized that Indigenous rights are not site-specific, giving the example of the impacts fish farms in the Discovery Islands have on Pacific wild salmon that migrate past them and into the interior of British Columbia.[94]

**Recommendation 21**

**That the government expand the CSAS process beyond scientists and individuals with a scientific background to be more inclusive of traditional Indigenous knowledge and harvesters' knowledge.**

**Recommendation 22**

**That DFO work to incorporate traditional Indigenous knowledge and fisher knowledge into its scientific activities and to give it greater consideration.**

**Recommendation 23**

**That DFO increase the collaborations with Indigenous peoples and fishers in the development of field and lab work, as well as in the development of scientific conclusions.**

**Recommendation 24**

**DFO should work with First Nations to develop a culturally appropriate way to use traditional Indigenous knowledge and fisher knowledge in management, such as to trigger early warning signs about the health of marine species and ecosystems.**

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93 Ibid.

94 Robert Chamberlin, Chairman, First Nation Wild Salmon Alliance, *Evidence*, 12 May 2022.

**Recommendation 25**

**Honour and respect existing fisheries and oceans management cogovernance agreements and implement those processes that are inclusive of Indigenous knowledge, ecosystem and precautionary thresholds.**

**Recommendation 26**

**That the government build scientific and technical capacity with First Nations and their organizations in recognition of their inherent Indigenous title and rights.**

## INDUSTRY INVOLVEMENT

Bernard Vigneault described current interactions between DFO and industry as follows:

> We have key collaborations and we consider the information provided by fishers in different ways. It can start from the very beginning. In some cases, we do data collection in partnership with industry, which provides us with samples and participates in sampling. It can also go as far as interpretation and peer review of the data, where we invite industry experts to provide and validate information about fishing activities, observations and methods used.[95]

Matthew Hardy, Regional Director of Science, Gulf Region, DFO, explained that DFO carries out projects in cooperation with industry stakeholders and that "information we derive from industry partnerships is an important factor in many of our assessments."[96]

Witnesses such as Keith Sullivan, Jean Lanteigne and Martin Mallet believed industry could collaborate more closely with DFO to supplement the department's ability to collect data.[97] Martin Mallet listed the benefits stemming from a collaborative science process:

> [Collaborative science processes] allow fishermen leaders within our membership to understand and buy into the science-backed management measures that are needed to improve our fisheries—for example, lobster and snow crab. For DFO scientists, they enable them to get to know and discuss with fishermen their daily, yearly and even generational observations and insights with regard to ecosystem patterns experienced while fishing. On many occasions, science projects are then developed to test some of

95 Bernard Vigneault, Director General, Ecosystem Science Directorate, DFO, *Evidence*, 26 April 2022.

96 Matthew Hardy, Regional Director, Science, Gulf Region, DFO, *Evidence*, 26 April 2022.

97 Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022; Jean Lanteigne, Director General, Fédération régionale acadienne des pêcheurs professionnels, *Evidence*, 9 June 2022; and Martin Mallet, Executive Director, Maritime Fishermen's Union, *Evidence*, 9 June 2022.

> these patterns with success. On all occasions, it's been an opportunity for all parties to exchange, raise awareness on issues and develop trust in a common science process. Where this formula has been used, we have seen success stories such as in the management of the lobster and snow crab fisheries in the southern Gulf of Saint Lawrence. However, with other resources such as herring and mackerel, we are currently facing challenges where this collaboration has not been established or is limited.[98]

**Recommendation 27**

**That DFO should work with fish harvesters to communicate, in a more open and transparent manner their work and scientific conclusions, especially in cases where the evidence seems at odds with the observations of fish harvesters.**

**Recommendation 28**

**That DFO make greater efforts to improve the flow of information from fish harvesters to the DFO Science branch about what they are seeing out on the water.**

**Recommendation 29**

**That DFO include knowledge and data collected by commercial fishers, including independent inshore fishers, in the peer review process, including their knowledge and observations regarding changes in distribution and abundance. That DFO formalize a system for fishers to participate and provide input in all aspects of fisheries management, including stock assessment protocols and management plans.**

**Recommendation 30**

**That DFO apply the same management measures to all fishers of a given species in a given fishing zone based primarily on science and stock conservation for a sustainable fishery.**

Industry witnesses expressed a desire for more opportunities for input in the CSAS process. Keith Sullivan was disappointed that a section for harvester or stakeholder observations was removed from the CSAS process.[99] Witnesses such as Jean Côté; Melanie Giffin; Kris Vascotto; Eda Roussel, Fisheries Advisor at the Association des crevettiers acadiens du Golfe; Herb Nash, President of the 4VN Management Board (as an individual); and Leonard LeBlanc, Professional Advisor, Gulf Nova Scotia Fishermen's

98 Martin Mallet, Executive Director, Maritime Fishermen's Union, *Evidence*, 9 June 2022.

99 Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022.

Coalition, felt that industry knowledge is not given the weight it deserves since harvesters are out on the water and are often the first to see changes.[100]

Christina Burridge described the contribution of industry experts and analysts as bringing "an understanding of fisheries and survey data, assessment methodologies, evaluation, and the management context that scientists may not have."[101] Jean Côté believed it was one thing to "consult" industry but that "sometimes you have to take our advice and what we say into account."[102] Christopher Jones added that current DFO consultations assume all fishers are part of an association. He felt that those who aren't "are discounted, not engaged, not involved and not contacted."[103]

**Recommendation 31**

**That DFO revitalize relationships with the recreational and commercial fishing industries and demonstrate fair process in decision-making.**

Not all witnesses believed that the involvement of industry should be increased. Robert Chamberlin spoke about the CSAS process for the Discovery Islands risk assessments and stated that a science peer review process that allows a proponent, which is a fish farm company, and industry stakeholders to participate "from the beginning to the end of this process is utterly and completely lacking any measure of objectivity or credibility."[104] He explained that such situations had led to "CSAS as a peer review secretariat [having] zero credibility with the first nation members of the First Nation Wild Salmon Alliance."[105]

100 Jean Côté, Scientific Director, Regroupement des pêcheurs professionnels du sud de la Gaspésie, *Evidence*, 2 June 2022; Melanie Giffin, Marine Biologist and Program Planner, Prince Edward Island Fishermen's Association, *Evidence*, 2 June 2022; Kris Vascotto, Executive Director, Atlantic Groundfish Council, *Evidence*, 21 June 2022; Eda Roussel, Fisheries Advisor, Association des crevettiers acadiens du Golfe, *Evidence*, 9 June 2022; Herb Nash, President 4VN Management Board, As an individual, Evidence, 7 October 2022; and Leonard LeBlanc, Professional Advisor, Gulf Nova Scotia Fishermen's Coalition, *Evidence*, 21 June 2022.

101 Christina Burridge, Executive Director, BC Seafood Alliance, *Evidence*, 2 June 2022.

102 Jean Côté, Scientific Director, Regroupement des pêcheurs professionnels du sud de la Gaspésie, *Evidence*, 2 June 2022.

103 Christopher Jones, Senior Fisheries Manager, Department of Fisheries and Oceans (Retired), As an individual, *Evidence*, 14 June 2022.

104 Robert Chamberlin, Chairman, First Nation Wild Salmon Alliance, *Evidence*, 12 May 2022.

105 Ibid.

## ROLE OF SCIENCE IN DECISION-MAKING AT FISHERIES AND OCEANS CANADA

Mona Nemer explained that science "helps government decision-makers gather data, analyze evidence and assess different policy options and their impacts" and added that "[open] science and transparency are essential not only for creating good policy, but also for maintaining and building trust in our public institutions."[106]

Greg Taylor believed that the "risk to our fisheries from decisions inconsistent with good science are immeasurably greater" than 40 years ago due to "the climate crisis, cumulative land and water use impacts and a decision-making process that continues to put fisheries before fish."[107] There was general agreement amongst witnesses that species should be managed in a way that prioritizes the long-term health of a species rather than yearly quotas.

Witnesses spoke about elements of good policy or approaches at DFO that were being incorrectly implemented. Greg Taylor believed Canada has a policy structure in place that would be "extremely effective in turning science advice into good management decisions. It's just that managers have not implemented it."[108] As an example, he pointed to the Sustainable Fisheries Framework, which provides specific direction to managers but unfortunately "these powerful science-based policies and the management guidance laid out within them are ignored in management decisions."[109] He added that independent monitoring or oversight could be added to the existing basic structure to ensure it is implemented.

Gideon Mordecai, Research Associate at the Institute for the Oceans and Fisheries, University of British Columbia (as an individual), argued it was important to focus on "making sure the science information can get to the decision-makers" without information being blocked at any of the various steps in the process.[110]

Greg Taylor mentioned that, contrary to the *Constitution of the State of Alaska* or the *Magnuson-Stevens Fishery Conservation and Management Act* in the United States, Canada does not have "an obligation to ensure decisions are consistent with a science-

106 Mona Nemer, Chief Science Advisor, Office of the Chief Science Advisor, *Evidence*, 26 April 2022.

107 Greg Taylor, Consultant and Fisheries Advisor, Watershed Watch Salmon Society, *Evidence*, 28 April 2022.

108 Ibid.

109 Ibid.

110 Gideon Mordecai, Research Associate, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 5 May 2022.

based management framework" and that acknowledging or considering policies is "a far cry from either implementing them or being bound by them as managers are in other jurisdictions such Alaska or the U.S."[111]

## Communication of Science Advice to the Minister

Many witnesses expressed concerns about the scientific advice that was being communicated to the Minister of Fisheries, Oceans and the Canadian Coast Guard; believing that incomplete, modified or misrepresented scientific conclusions may be being provided to the Minister. They believed the advice of competent DFO scientists was being edited along the way to reflect policy preferences. Jesse Zeman stated that his organization was "not concerned with DFO scientists' ability to conduct science. It is concerned with decision-makers and senior managers' willingness to edit, suppress and hide that science."[112] Josh Korman believed a "sort of firewall […] to confirm that what the science says is translated into the management advice" was needed, sharing that key conclusions from the Recovery Potential Assessment report for interior Fraser steelhead, for which he was the senior author, were not reflected in management advice.[113] Charlotte K. Whitney shared that when disconnects occur between science advice and management decisions, "they have led to management decisions that maintain a status quo rather than applying the best available science."[114]

Judith Leblanc, Science Advisor at DFO, stated that over her 26 years at DFO, she had learned to accept her "area of influence" and that her duties as science advisor included providing science advice to the department's management but that once the advice is submitted, the "decisions rest with management," not with her in her role as science advisor.[115] Dr. Kristi Miller-Saunders agreed and added that "[w]e have very little control or a limited amount of input on what science moves forward to the minister, or even to upper managers in Ottawa, and how they utilize that science."[116]

Sean Jones, Legal Counsel at Wild First, believed that

111 Greg Taylor, Consultant and Fisheries Advisor, Watershed Watch Salmon Society, *Evidence*, 28 April 2022.

112 Jesse Zeman, Executive Director, B.C. Wildlife Federation, *Evidence*, 28 April 2022.

113 Josh Korman, Fisheries Scientist, Ecometric Research Inc., *Evidence*, 5 May 2022.

114 Charlotte K. Whitney, Program Director, Fisheries Management and Science, Central Coast Indigenous Resource Alliance, *Evidence*, 28 April 2022.

115 Judith Leblanc, Science Advisor, DFO, *Evidence*, 26 April 2022.

116 Dr. Kristi Miller-Saunders, Senior Research Scientist, DFO, *Evidence*, 26 April 2022.

> DFO managers need to allow scientists to communicate directly with those decision-makers and allow the briefing notes and materials that they prepare to go unadulterated to the minister. We've documented numerous examples where scientists are trying to get critical information to the minister, but DFO managers simply interfere and rewrite the materials, so that the science that is presented is done in a way that confirms existing policy, rather than presenting the minister with the best available information.[117]

He added that DFO would likely see fewer decisions being overturned on judicial reviews if "DFO managers were providing the minister with a more fulsome and objective representation of the evidence before her."[118]

Examples of situations where peer-reviewed science advice about wild Pacific salmon was seemingly not translated into management advice or not communicated to the Minister is discussed in an upcoming section.

## Integration of Fisheries Science and Other Considerations into Fisheries Management Decisions

According to Sessional Paper 8555-431-445, tabled in the House of Commons on 20 July 2020, the CSAS process "explicitly does not consider socioeconomic impacts or the management implications of the advice. The science advice is intended to serve as an input into the decision-making process."[119] However, some witnesses felt that desired policy outcomes often taint the science advice before it reaches the Minister.

Andrew Bateman believed that science was not the only decision-making factor at the table and that DFO was manipulating science advice. He added that decision-makers

> have to weigh competing or complementary demands, the economy being one of them. It's really that the science advice that's presented to the decision-makers, ultimately to the minister, needs to be unfettered by departmental manipulation by mid- and upper-level managers.[120]

Martin Mallet, Keith Sullivan, Martin Paish, Director, Business Development at the Sport Fishing Institute of British Columbia, and Jean Lanteigne agreed that, along with scientific data, social and economic factors should be considered by the Minister as

117 Sean Jones, Legal Counsel, Wild First, *Evidence*, 14 June 2022.

118 Ibid.

119 Government of Canada, *Sessional Paper 8555-431-445*, July 2020.

120 Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

critical components of fishery sustainability.[121] Witnesses underscored the need for transparent and independent scientific advice to be provided to the Minister without it having been tainted by other considerations. John Reynolds, Chair of the Committee on the Status of Endangered Wildlife in Canada, described such a process:

> You can model or advise on what the potential options are and what are mostly likely to be effective. The minister then can take that information about the options and what the science is that is supporting those options, and then bring in these other factors that they have to consider, the trade-offs and the people who will be harmed by the management actions, for example. As long as that's done in a transparent and open way so that people can see where the science enters and what other factors were being considered, then that would certainly be a process that I think a lot of people could sign up to.[122]

Outside of the CSAS process, DFO does conduct economic analyses to assist departmental decision-makers evaluating the impacts of resource management, policy and regulatory decisions.[123] Witnesses questioned the level of detail within what the department called a socio-economic analysis. Tasha Sutcliffe, Senior Policy Advisor at Ecotrust Canada, suggested that what the department considers a socio-economic analysis is actually a "very shallow economic analysis. It doesn't go into enough detail on the basic economics around distribution of benefit, coastal community impacts, incomes, for example."[124] Martin Mallet agreed that "socio-economic science expertise is sorely lacking and is needed more than ever to help us better plan and adapt to [the changes in the ecology, distribution and biomass of several species due to climate change] that are affecting our fisheries and the coastal communities that depend on them."[125]

Witnesses believed that ignoring early trends and waiting to act risked leading to larger, more drastic actions being required later to protect species. Jean Lanteigne believed that DFO "lets things drag on until its back is against the wall; then it starts asking what it can do. Very often, it ends up closing the fishery because that's all it can do when things get to that point. That's no solution."[126] Dominique Robert gave the example of the Atlantic

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121 Martin Mallet, Executive Director, Maritime Fishermen's Union, *Evidence*, 9 June 2022; Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022; Martin Paish, Director, Business Development, Sport Fishing Institute of British Columbia, *Evidence*, 9 June 2022; and Jean Lanteigne, Director General, Fédération régionale acadienne des pêcheurs professionnels, *Evidence*, 9 June 2022.

122 John Reynolds, Chair, Committee on the Status of Endangered Wildlife in Canada, *Evidence*, 5 May 2022.

123 DFO, *Economic analysis*.

124 Tasha Sutcliffe, Senior Policy Advisor, Ecotrust Canada, *Evidence*, 12 May 2022.

125 Martin Mallet, Executive Director, Maritime Fishermen's Union, *Evidence*, 9 June 2022.

126 Jean Lanteigne, Director General, Fédération régionale acadienne des pêcheurs professionnels, *Evidence*, 9 June 2022.

mackerel commercial and bait fisheries in Quebec and Atlantic Canada being closed with very little warning in 2022 after at least a decade of DFO stock assessments indicating that fishing pressure on the stock was too high, stating that: "It was the right decision to make given the state of the stock, but I think mackerel fishing should have been suspended or severely restricted long before that."[127]

**Recommendation 32**

**That DFO consult those who could be most socio-economically impacted by its decisions and ensure that the socio-economic impacts on communities and the fishing industry are factored in its decision-making processes. The assessment of economic and social impacts resulting from decisions should be provided when requested by Canadians.**

**Recommendation 33**

**That the Government of Canada request that the Chief Science Advisor**

- **undertake an examination of how DFO fisheries management officials influence the work and findings of DFO scientists; and**
- **produce a report to government including**
  - **an assessment of such influence,**
  - **whether this influence is appropriate and ethical; and**
  - **recommendations, if necessary, of how to reform fisheries management influence on science in DFO in order to increase independence of DFO science and ensure there is an established conduit for science to be directly channeled from scientists to decision-makers for them to consider when making decisions.**

**Recommendation 34**

**That the Government of Canada request that the Chief Science Advisor**

- **assess the viability of restructuring existing DFO systems and processes in a manner that would ensure that science advice is independently**

127 Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology, Institut des sciences de la mer, Université du Québec à Rimouski, As an individual, *Evidence*, 5 May 2022.

**collated, assessed and delivered to managers and decision-makers by DFO scientists; and**

- **produce a report with recommendations from this assessment and that that report be tabled by the government in the House of Commons by 2024.**

**Recommendation 35**

**That the Government of Canada request that the Chief Science Advisor**

- **examine to what degree science advice from scientists is implemented in DFO management and decision-making processes; and**

- **produce a report with advice and recommendations for establishing protocols to measure to what degree science advice from scientists is implemented in DFO management and decision-making processes and that this report be tabled in the House of Commons by 2024.**

**Recommendation 36**

**That the Government of Canada develop and table legislation that establishes a science-based fisheries management framework and a requirement for the government, through DFO, to ensure that DFO decisions align with the science-based management framework and demonstrate alignment of decisions with the framework by publicly releasing scientific reasons and other factors for decisions.**

**Recommendation 37**

**That the Government of Canada initiate an independent audit of how and to what degree DFO has implemented the Sustainable Fisheries Framework and that the resulting audit report be tabled in the House of Commons by December 15, 2023.**

**Recommendation 38**

**That the Government of Canada request that the Chief Science Advisor**

- **assess the viability of establishing an independent science advice body to directly advise DFO decision-makers, assess health and performances of fisheries, make recommendations on scientific research priorities, and oversee the implementation of science-based activities; and**

- **provide this assessment in a report with recommendations to the government to be tabled by 2024.**

## NEED FOR AND USE OF SCIENCE IN RELATION TO PARTICULAR SPECIES

Witnesses shared examples where they felt scientific conclusions had been suppressed or modified before reaching the Minister or where the decisions taken seemed counter to scientific advice or data. For example:

- Greg Taylor described the "arbitrary decision to cut in half the harvest of herring on the west coast" in 2022, even though the fishery had been managed in a way that was consistent with both science advice and policy up until that point.[128]

- Charlotte K. Whitney wondered why the TAC for Bocaccio, a Pacific rockfish, was increased 24-fold from 75 tonnes to 1,800 tonnes based on an unusually strong recruitment event in 2016.[129]

- Jean Côté described a second commercial lobster fishing season opened in 2020, ostensibly to collect data, in Lobster Fishing Area 21 that seemed counter to recent DFO science advice that "in the context of environmental change, inducing a new source of variability is undesirable."[130]

- Phil Morlock, Director, Government Affairs at the Canadian Sportfishing Industry Association, stated that "official DFO policy" seemed to have become "[a]rbitrary public access closures by percentage targets with no basis in science or evidence of benefit."[131]

128 Greg Taylor, Consultant and Fisheries Advisor, Watershed Watch Salmon Society, *Evidence*, 28 April 2022.

129 Charlotte K. Whitney, Program Director, Fisheries Management and Science, Central Coast Indigenous Resource Alliance, *Evidence*, 28 April 2022.

130 Jean Côté, Scientific Director, Regroupement des pêcheurs professionnels du sud de la Gaspésie, *Evidence*, 2 June 2022.

131 Phil Morlock, Director, Government Affairs, Canadian Sportfishing Industry Association, *Evidence*, 9 June 2022.

Witnesses also told the Committee about situations where they believed more data was needed or that data appeared to have been ignored. For example:

- Eda Roussel suggested more data was needed to understand the impact of rockfish predation on shrimp.[132]

- Keith Sullivan expressed frustration at the recent closure of the Atlantic mackerel fishery despite repeated proposals to study harvesters' observations of small mackerel that were likely not born in the Gulf of St. Lawrence: "It's really disappointing when a result ends up in a moratorium and you believe there are people thrown out of work, when there are questions that could have been answered."[133] Melanie Giffin suggested that standardized voluntary logbooks could be a way to record the small mackerel currently being anecdotally reported in Prince Edward Island and Newfoundland. The information could then be forwarded to DFO.[134]

- Martin Mallet described a roughshod protocol developed quickly with DFO to collect data on the spring herring fishery, after the closure of the fishery led to the loss of access to data previously collected by harvesters.[135]

Two specific examples are described in more detail below.

## Example: The Impact of Pinnipeds on Various Fish Stocks

Witnesses discussed the impact of increasing pinniped populations on various fish stocks, including West and East coast salmon, mackerel, herring, capelin, Atlantic cod and Atlantic mackerel. Keith Sullivan questioned if fishing quotas could ever be reduced enough to lead to a rebuilding of stocks if increasing pinniped populations consume more than the quotas themselves.[136] Robert Hardy, Fisheries Consultant, stated that DFO Science is reluctant to accept the impact of seals on any fish stocks, and instead

132 Eda Roussel, Fisheries Advisor, Association des crevettiers acadiens du Golfe, *Evidence*, 9 June 2022.

133 Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022.

134 Melanie Giffin, Marine Biologist and Program Planner, Prince Edward Island Fishermen's Association, *Evidence*, 2 June 2022.

135 Martin Mallet, Executive Director, Maritime Fishermen's Union, *Evidence*, 9 June 2022.

136 Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022.

remains dismissive and ignores the evidence provided by fishers, Indigenous peoples, industry associations and seal science from other North Atlantic fishing nations.[137]

Josh Korman described to the Committee how the main conclusions of the Science Advisory Report (SAR) for interior Fraser steelhead were not consistent with the main findings of the Recovery Potential Assessment report, which was developed in a peer-reviewed CSAS process. A main conclusion of the Recovery Potential Assessment report was that

> reductions in the abundance of seals and sea lions was deemed to be the most effective way of recovering steelhead populations. This fundamental conclusion was substantially altered by DFO when they wrote the SAR. For example, they stated there was no consensus that there was a causal relationship between the two—meaning a relation between steelhead and seals and sea lions.[138]

Josh Korman did not recall hearing any substantiated objections to the conclusions that reducing pinniped abundance is the most effect way to recovering steelhead populations but could not document the discrepancy because the proceedings of the CSAS process are not publicly available. He believed this misrepresentation was problematic because it "misrepresents the primary tool available to us to improve the status of interior Fraser steelhead and likely for chinook and other salmon."[139]

Keith Sullivan, Robert Hardy, and Leonard LeBlanc expressed the desire to include the fishing industry and local communities in plans to establish a market for seal products.[140] Mark Prevost, President of Bait Masters Inc., believed that a potential use for seal byproducts could be as an ingredient in alternative bait sausages for the crustacean fishery.[141]

Other witnesses expressed caution at the idea of managing pinniped populations as a way of increasing the number of fish available for fishers. Jeffery Young mentioned that the removal of predators such as pinnipeds could have unexpected and unpredictable impacts on the ecosystem.[142] Alexandra Morton explained that seals and sea lions prey

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137 Robert Hardy, Fisheries Consultant, As an individual, *Evidence*, 14 June 2022.

138 Josh Korman, Fisheries Scientist, Ecometric Research Inc., *Evidence*, 5 May 2022.

139 Ibid.

140 Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, *Evidence*, 2 June 2022; Robert Hardy, Fisheries Consultant, As an individual, *Evidence*, 14 June 2022; and Leonard LeBlanc, Professional Advisor, Gulf Nova Scotia Fishermen's Coalition, *Evidence*, 21 June 2022.

141 Mark Prevost, President, Bait Masters Inc., *Evidence*, 21 June 2022.

142 Jeffery Young, Senior Science and Policy Analyst, David Suzuki Foundation, *Evidence*, 14 June 2022.

on hake which consume juvenile salmon. A reduced pinniped population could mean a larger hake population and stronger hake predation on juvenile salmon.[143]

**Recommendation 39**

**That scientists conduct pinniped diet analysis for all species of pinnipeds over longer periods of the year in more diverse regions than in the past and make their data publicly available by posting it on the DFO website.**

**Recommendation 40**

**That, in order to accurately assess the effects of pinniped predation when estimating mortality levels in fish stock biomass, scientists compare data from countries with similar species of pinnipeds.**

## Example: Aquaculture and Wild Pacific Salmon

Witnesses told the Committee about different situations related to wild Pacific salmon that illustrate many of the different issues described with the CSAS process including conflicts of interest for participants and the inappropriate use of consensus. They also told the Committee about problems with transparency and the communication of scientific information to the public and with the communication of science advice to the Minister. Jesse Zeman summarized the situation as follows: “When there is good science and it affects DFO management, that science is hidden or edited or suppressed from Canadians.”[144]

Additionally, witnesses frequently mentioned the apparent conflict of interest within DFO between its mandate to protect aquatic species and its mandate to regulate and promote aquaculture. Alexandra Morton did not understand why there was a “big, aggressive, powerful aquaculture management division in DFO and nothing to counterbalance it with the wild salmon […] Aquaculture is thriving. Wild salmon are collapsing. It's pretty clear that they need advocates within DFO.”[145] She gave the example of a situation where industry communicated to DFO that proposed aquaculture conditions of license related to the limit of sea lice per farmed salmon

> “could have significant impact on... the... financial performance of Mowi's operations”. Specifically mentioning sea lice, they say that the pace of “regulatory change is

143 Alexandra Morton, Independent Scientist, As an individual, *Evidence*, 12 May 2022.

144 Jesse Zeman, Executive Director, B.C. Wildlife Federation, *Evidence*, 28 April 2022.

145 Alexandra Morton, Independent Scientist, As an individual, *Evidence*, 12 May 2022.

> outpacing our company's capacity." Two weeks later, the draft conditions of licence contained the weakened requirement to produce a plan to reduce sea lice, with no requirement that the plan was actually successful.[146]

Sean Jones and Alexandra Morton believed that an independent scientific advisor should be appointed to advise the Minister on scientific evidence related to the impacts of aquaculture on wild Pacific salmon.[147]

Rebecca Reid, Regional Director General of DFO's Pacific Region, explained that the regional director in the Pacific region is responsible for the management of all fisheries in the Pacific region as well as for aquaculture.[148] She believed DFO understands its role and responsibilities for the management of wild salmon and aquaculture and does so appropriately. Sarah Murdoch, Senior Director of Pacific Salmon Strategy Transformation at DFO, described a new group launched at DFO through the Pacific Salmon Strategy Initiative that works with "colleagues and representatives from branches throughout the department that do salmon work, whether that be salmon science, fish management, enforcement or salmon enhancement."[149]

**Recommendation 41**

**Given the conflict of interest between DFO's mandate relating to aquaculture versus the application of the precautionary principle and the ongoing crisis for the health of wild Pacific salmon stocks, that the government implement, on the West Coast only, Recommendation #3 in the Cohen Commission report on the state of wild salmon:**

> **"The Government of Canada should remove from the Department of Fisheries and Oceans' mandate the promotion of salmon farming as an industry and farmed salmon as a product."**

**Recommendation 42**

**That the Government of Canada initiate an independent audit of what recommendations of the December 2018 report titled "*Report of the Independent Expert Panel on Aquaculture Science*" have been implemented by DFO, how many have been fully implemented and timelines for full implementation for recommendations that are not**

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146 Ibid.

147 Sean Jones, Legal Counsel, Wild First, *Evidence*, 14 June 2022; Alexandra Morton, Independent Scientist, As an individual, *Evidence*, 12 May 2022; and

148 Rebecca Reid, Regional Director General, Pacific Region, DFO, *Evidence*, 7 October 2022.

149 Sarah Murdoch, Senior Director, Pacific Salmon Strategy Transformation, DFO, *Evidence*, 7 October 2022.

**yet fully implemented and that the resulting audit report be tabled in the House of Commons by June 9, 2023.**

**Recommendation 43**

**That, in light of the established aquaculture management division within the department and that DFO favours the interest of the salmon-farming industry over the health of wild fish stocks, DFO establish a wild salmon position independent from this division as recommended in Recommendation 4 of the Cohen Commission report to maintain impartiality.**

**Recommendation 44**

**That DFO place appropriate and adequate value to perspectives provided by the External Advisory Committee on Aquaculture Science, and reflect such perspectives in policy recommendations and advice to the Minister of Fisheries, Oceans and the Canadian Coast Guard, and that the work of the External Advisory Committee on Aquaculture Science be reported to Parliament on an annual basis.**

## Conflict of Interest for Participants in Canadian Science Advisory Secretariat Processes related to Pacific Salmon

Gideon Mordecai spoke about the presence of the salmon farming industry during CSAS assessments of the impacts of PRV on wild Pacific salmon, stating that "[n]ormally in science, reviewers who have a conflict of interest are often excluded, especially if the conflict is financial."[150] Sean Jones agreed since "industry licensees were asked to vote on how to diagnose a disease that, if diagnosed, would create significant regulatory burdens on their operations."[151]

Andrew Bateman described the CSAS processes for the Discovery Island risk assessments in which he participated as follows:

> The processes were neither unbiased nor independent. The risk assessments were implemented, closely managed and influenced by senior officials from DFO aquaculture, and employees, contractors and others linked to the salmon farming industry served on

150 Gideon Mordecai, Research Associate, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 5 May 2022.

151 Sean Jones, Legal Counsel, Wild First, *Evidence*, 14 June 2022.

> the steering committee and as senior reviewers, so that conflict of interest threatened the integrity of the process.[152]

## Use of Consensus in Canadian Science Advisory Secretariat Processes related to Pacific Salmon

In the context of the assessment of the risk to Fraser River sockeye salmon due to the transfer of *Tenacibaculum maritimum* from Atlantic Salmon farms in the Discovery Islands area, Andrew Bateman felt that "dissenting voices were all but bulldozed, such that the resulting advice document doesn't reflect the true reality of opinion."[153] He added that, for the Discovery Island risk assessments as a whole, the "findings of minimal risk reflect neither the current state of knowledge nor true scientific consensus. Key risks were omitted. Sea lice, cumulative effects and the conservation status of the sockeye stocks were ignored."[154]

## Transparency and Communication of Scientific Information related to Pacific Salmon

Gideon Mordecai, Alexandra Morton, and others believed the impacts of PRV and *Tenacibaculum maritimum* on Pacific wild salmon were being minimized by DFO in favour of the aquaculture industry.[155] Sean Jones agreed, sharing that his experiences had convinced him that:

> [T]he aquaculture management directorate and the Canadian science advisory secretariat consistently suppress, misrepresent and ignore the scientific evidence demonstrating that open net-pen feedlots of Atlantic salmon threaten the survival of wild Pacific salmon. DFO relies on this suppression and misrepresentation to excuse itself from executing its legal obligations, both domestically and internationally.[156]

Stan Proboszcz, Senior Scientist at the Watershed Watch Salmon Society, believed that DFO may have decided to complete only nine risk assessments for aquaculture operations in the Discovery Islands area and not a 10th risk assessment on the effects of

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152 Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

153 Ibid.

154 Ibid.

155 Gideon Mordecai, Research Associate, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 5 May 2022; Alexandra Morton, Independent Scientist, As an individual, *Evidence*, 12 May 2022; and Sean Jones, Legal Counsel, Wild First, *Evidence*, 14 June 2022.

156 Sean Jones, Legal Counsel, Wild First, *Evidence*, 14 June 2022.

sea lice on sockeye salmon to avoid publicizing inconvenient research. Initial lab studies on the effects of sea lice on sockeye salmon

> turned out to be quite significant in showing that sea lice dramatically affect the health of sockeye salmon. DFO started to communicate about this evidence that they had of minimal risk, but they don't talk about these studies at all in their communications at the press conference or later on, when they talked to media people.[157]

**Recommendation 45**

**Given the perceived issues with the DFO's risk assessment of the impact of aquaculture operations in the Discovery Islands on wild fish stocks including:**

- **the failure to assess the cumulative impacts of the viruses and bacteria detected; and**
- **the suppression of additional research that could have had a material impact on the overall risk assessment,**

**that DFO submit to an independent review of the risk assessment, including but not limited to decisions on the assessment's terms of reference and factors that resulted in the suppression of research findings on the impact of sea lice and possibly other issues with a material impact on the health of wild fish stocks. That there be an independent audit and analysis to determine the accuracy and decision-informing value of the Science Advisory Report presented to the Minister of Fisheries, Oceans and the Canadian Coast Guard on DFO's risk assessment of aquaculture operations in the Discovery Islands.**

**Recommendation 46**

**That the Minister of Fisheries, Oceans and the Canadian Coast Guard provide in writing to the Committee a statement as to whether or not DFO omitted, canceled or in any other way did not complete or make unavailable a 10th CSAS risk assessment examining potential risks to Fraser sockeye.**

Dr. Kristi Miller-Saunders described the long delay between the drafting of a report on PRV and its publication. The 2012 report showed that PRV, a virus that may cause heart disease in salmon species, had been detected in farmed Chinook salmon that were suffering from disease. This was the "first sign that PRV might pose a risk to Pacific

157 Stan Proboszcz, Senior Scientist, Watershed Watch Salmon Society, *Evidence*, 12 May 2022.

salmon."[158] The publication delay "was due to a disagreement between [Dr. Miller-Saunders] and the industry vets on the interpretation of the science. That delay has continued for 10 years, because apparently there needs to be an agreement on the interpretation of the science before the report can be put in, or before a manuscript can be prepared."[159] Gideon Mordecai wondered whether, if this work had not been "held back from the scientific community, perhaps some of the impact on salmon in B.C. from this virus may have been prevented."[160]

**Recommendation 47**

**That in light of new scientific revelations of potential impacts of *Tenacibaculum maritimum* and *Piscine orthoreovirus* (PRV) on wild Pacific salmon, the Government of Canada request that the Chief Science Advisor assess and make recommendations to the Minister of Fisheries, Oceans and the Canadian Coast Guard on the potential necessity for a CSAS assessment of risks posed by *Tenacibaculum maritimum* and PRV on all species of wild Pacific salmon, including Fraser sockeye.**

Jesse Zeman described the long, frustrating process to attempt to gain access to information related to Fraser steelhead which involved an Access to Information and Privacy (ATIP) request. He relayed how, following a complaint by the B.C. Wildlife Federation about the 10-month turnaround for the request given by DFO, the Office of the Information Commissioner found that the exclusion was not reasonable given the circumstances even if DFO had deemed refusal of access to the requested records. The Office informed the B.C. Wildlife Federation that pursuing this issue further would mean applying to the Federal Court for a review. Jesse Zeman though it was unreasonable to expect his organization to pay legal fees to gain access to records paid for by Canadians. In his opinion, the refusal to grant access means that "transparency within this institution is non-existent. Within the context of science, it means that DFO is willing and happy to not only hide and edit science. It is now happy to refuse to disclose records."[161]

Andrew Bateman was dismayed that, even ignoring problems with the CSAS process itself, CSAS findings can be "misrepresented by some within DFO." He gave the example of the findings from the sockeye risk assessments being used to "argue that B.C. salmon

158 Gideon Mordecai, Research Associate, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 5 May 2022.

159 Dr. Kristi Miller-Saunders, Senior Research Scientist, DFO, *Evidence*, 26 April 2022.

160 Gideon Mordecai, Research Associate, Institute for the Oceans and Fisheries, University of British Columbia, As an individual, *Evidence*, 5 May 2022.

161 Jesse Zeman, Executive Director, B.C. Wildlife Federation, *Evidence*, 28 April 2022.

farming poses no more than a minimal risk to wild salmon. This is absolutely not what the CSAS studies found, being highly specific to the risks from Discovery Islands farms to Fraser River sockeye salmon alone."[162]

Josh Korman had observed "substantive meddling by DFO in the conversion of a recovery potential assessment report for interior Fraser steelhead into the scientific advice report."[163] John Reynolds gave an example of this meddling by describing the reduced emphasis of the role of bycatch as an ongoing threat to Steelhead, noting that bycatch is the responsibility of DFO.[164] He also stated that DFO has, until recently, denied the harm caused to wild salmon by salmon farming which suggested to him that "policy preferences [had] been affecting science advice rather than the other way around."[165]

## Communication of Science Advice related to Pacific Salmon to the Minister

Sean Jones and Andrew Bateman compared the current situation regarding DFO and its action on aquaculture and wild Pacific salmon to the situation in the 1990s related to the collapse of cod stocks.[166]

Jesse Zeman described information he obtained about the development of the Science Advisory Report for the Recovery Potential Assessment for interior Fraser steelhead as part an ATIP request. The Recovery Potential Assessment was triggered by a recommendation by the Committee on the Status of Endangered Wildlife in Canada to list interior Fraser steelhead as endangered. He stated that, in this case, the CSAS process was "completely undermined" by DFO. He noted that the thousands of pages received in the ATIP of the CSAS process

> revealed the assistant deputy minister's office gave a directive to modify some key points related to allowable harm for interior Fraser steelhead. Additionally, the chair of the process indicated they were cut out of the process and expressed serious concerns about the scientific integrity of the process. Furthermore, in these documents the chair

162 Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

163 Josh Korman, Fisheries Scientist, Ecometric Research Inc., *Evidence*, 5 May 2022.

164 John Reynolds, Chair, Committee on the Status of Endangered Wildlife in Canada, *Evidence*, 5 May 2022.

165 Ibid.

166 Sean Jones, Legal Counsel, Wild First, *Evidence*, 14 June 2022; and Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, *Evidence*, 28 April 2022.

> states that there were things that happened to the SAR, science advisory report, after they signed it off.[167]

Jesse Zeman shared that the Recovery Potential Assessment for interior Fraser steelhead has not been published years after its completion. He was not aware of this happening for "any other species that has gone through this process associated with the *Species at Risk Act*."[168]

**Recommendation 48**

**That, within 60 days after of this report being presented to the House of Commons, DFO make publicly available on their website all documents, including working papers, the Science Advisory Report and the Recovery Potential Assessment, associated with the CSAS assessment of interior Fraser steelhead in British Columbia.**

## CONCLUSION

Throughout the study, the Committee heard about the high-quality science produced by DFO scientists and witnesses agreed that DFO scientists do excellent work. The Committee also heard examples of how integrating additional knowledge sources, such as Indigenous knowledge and fisher knowledge, can help inform, frame, and interpret scientific data. Some witnesses told the Committee that DFO has the policies and guidelines necessary to produce the science advice necessary to inform fisheries management decisions, but that better implementation of these policies and guidelines is required to make what is good on paper good in practice.

Many witnesses also shared their concerns regarding steps within the CSAS process, including the perceived conflicts of interests of some participants and the quality of the science advice provided to the Minister and other decision-makers. Witnesses also questioned what information was being communicated to the Minister and whether information meant to inform ministerial decisions had been manipulated before reaching the Minister or was being withheld. This lack of transparency can undermine trust in DFO's decision-making process.

In the context of a changing ocean, witnesses agreed that the best fisheries management decisions are based in sound science. A decision-making process that is based on sufficient and appropriate data and transparently considers the environmental

167 Jesse Zeman, Executive Director, B.C. Wildlife Federation, *Evidence*, 28 April 2022.

168 Ibid.

and socio-economic impacts of decisions is the best way to manage Canada's aquatic resources while also maintaining Canadians' trust in the process.

# APPENDIX A
# LIST OF WITNESSES

The following table lists the witnesses who appeared before the committee at its meetings related to this report. Transcripts of all public meetings related to this report are available on the committee's webpage for this study.

| Organizations and Individuals | Date | Meeting |
|---|---|---|
| **Department of Fisheries and Oceans** | 2022/04/26 | 18 |
| Matthew Hardy, Regional Director, Science, Gulf Region | | |
| Judith Leblanc, Science Advisor | | |
| Kristi Miller-Saunders, Senior Research Scientist | | |
| Andrew Thomson, Regional Director, Science, Pacific Region | | |
| Bernard Vigneault, Director General, Ecosystem Science Directorate | | |
| Kristana Worcester, Director, Strategic Science Planning and Program Integrity | | |
| **Office of the Chief Science Advisor** | 2022/04/26 | 18 |
| Mona Nemer, Chief Science Advisor | | |
| **B.C. Wildlife Federation** | 2022/04/28 | 19 |
| Jesse Zeman, Executive Director | | |
| **Central Coast Indigenous Resource Alliance** | 2022/04/28 | 19 |
| Alejandro Frid, Science Coordinator | | |
| Charlotte K. Whitney, Program Director, Fisheries Management and Science | | |
| **Fraser Salmon Management Council** | 2022/04/28 | 19 |
| Michael Staley, Biologist | | |
| **Pacific Salmon Foundation** | 2022/04/28 | 19 |
| Andrew Bateman, Manager, Salmon Health | | |
| Brian E. Riddell, Science Advisor | | |

| Organizations and Individuals | Date | Meeting |
|---|---|---|
| **Watershed Watch Salmon Society** | 2022/04/28 | 19 |
| Greg Taylor, Consultant and Fisheries Advisor | | |
| **As an individual** | 2022/05/05 | 21 |
| Gideon Mordecai, Research Associate,<br>Institute for the Oceans and Fisheries, University of British Columbia | | |
| Greig Oldford, PhD Candidate and Scientist,<br>University of British Columbia | | |
| Dominique Robert, Professor and Canada Research Chair in Fisheries Ecology,<br>Institut des sciences de la mer, Université du Québec à Rimouski | | |
| **Committee on the Status of Endangered Wildlife in Canada** | 2022/05/05 | 21 |
| John Reynolds, Chair | | |
| **Ecometric Research Inc.** | 2022/05/05 | 21 |
| Josh Korman, Fisheries Scientist | | |
| **Ocean Networks Canada** | 2022/05/05 | 21 |
| Kathryn Moran, President and Chief Executive Officer | | |
| **As an individual** | 2022/05/12 | 23 |
| Michael Dadswell, Retired Professor of Biology,<br>Acadia University | | |
| Alexandra Morton, Independent Scientist | | |
| **Ecotrust Canada** | 2022/05/12 | 23 |
| Tasha Sutcliffe, Senior Policy Advisor | | |
| **First Nation Wild Salmon Alliance** | 2022/05/12 | 23 |
| Robert Chamberlin, Chairman | | |
| **Watershed Watch Salmon Society** | 2022/05/12 | 23 |
| Stan Proboszcz, Senior Scientist | | |
| **BC Seafood Alliance** | 2022/06/02 | 25 |
| Christina Burridge, Executive Director | | |
| **Fish, Food and Allied Workers - Unifor** | 2022/06/02 | 25 |
| Keith Sullivan, President | | |

| Organizations and Individuals | Date | Meeting |
|---|---|---|
| **Lower Fraser Fisheries Alliance** | 2022/06/02 | 25 |
| Aidan Fisher, Biologist | | |
| **Prince Edward Island Fishermen's Association** | 2022/06/02 | 25 |
| Melanie Giffin, Marine Biologist and Industry Program Planner | | |
| **Regroupement des pêcheurs professionnels du sud de la Gaspésie** | 2022/06/02 | 25 |
| Jean Côté, Scientific Director | | |
| **Association des crevettiers acadiens du Golfe** | 2022/06/09 | 27 |
| Eda Roussel, Fisheries Advisor | | |
| **Canadian Sportfishing Industry Association** | 2022/06/09 | 27 |
| Phil Morlock, Director, Government Affairs | | |
| **Fédération régionale acadienne des pêcheurs professionnels** | 2022/06/09 | 27 |
| Jean Lanteigne, Director General | | |
| **Maritime Fishermen's Union** | 2022/06/09 | 27 |
| Martin Mallet, Executive Director | | |
| **Public Fishery Alliance** | 2022/06/09 | 27 |
| Dave Brown | | |
| **South Vancouver Island Anglers Coalition** | 2022/06/09 | 27 |
| Christopher J. Bos, President | | |
| **Sport Fishing Institute of British Columbia** | 2022/06/09 | 27 |
| Owen Bird, Executive Director | | |
| Martin Paish, Director, Business Development | | |
| **As an individual** | 2022/06/14 | 28 |
| Robert Hardy, Fisheries Consultant | | |
| Christopher Jones, Senior Fisheries Manager, Department of Fisheries and Oceans (Retired) | | |
| Andrew Trites, Professor, Marine Mammal Research Unit, Institute for the Oceans and Fisheries, University of British Columbia | | |

| Organizations and Individuals | Date | Meeting |
|---|---|---|
| **David Suzuki Foundation** | 2022/06/14 | 28 |
| Jeffery Young, Senior Science and Policy Analyst | | |
| **Oceana Canada** | 2022/06/14 | 28 |
| Robert Rangeley, Director of Science | | |
| **Wild First** | 2022/06/14 | 28 |
| Sean Jones, Lawyer | | |
| **Atlantic Groundfish Council** | 2022/06/21 | 30 |
| Kris Vascotto, Executive Director | | |
| **Bait Masters Inc.** | 2022/06/21 | 30 |
| Wally MacPhee, Vice-President | | |
| Mark Prevost, President | | |
| **Gulf Nova Scotia Fishermen's Coalition** | 2022/06/21 | 30 |
| Leonard LeBlanc, Professional Advisor | | |
| **Ocean Choice International L.P.** | 2022/06/21 | 30 |
| Carey Bonnell, Vice-President<br>Sustainability and Engagement | | |
| **As an individual** | 2022/10/07 | 34 |
| Morley Knight | | |
| **4VN Management Society** | 2022/10/07 | 34 |
| Herb Nash, President | | |
| **Department of Fisheries and Oceans** | 2022/10/07 | 34 |
| Adam Burns, Acting Assistant Deputy Minister,<br>Fisheries and Harbour Management | | |
| Neil Davis, Regional Director,<br>Fisheries Management Branch, Pacific Region | | |
| Arran McPherson, Assistant Deputy Minister,<br>Ecosystems and Oceans Science | | |
| Sarah Murdoch, Senior Director,<br>Pacific Salmon Strategy Transformation | | |
| Rebecca Reid, Regional Director General,<br>Pacific Region | | |
| Doug Wentzell, Regional Director General,<br>Maritimes Region | | |

# APPENDIX B
# LIST OF BRIEFS

The following is an alphabetical list of organizations and individuals who submitted briefs to the committee related to this report. For more information, please consult the committee's webpage for this study.

**Allard, Tony**

**Atlantic Groundfish Council**

**BC Seafood Alliance**

**Breau, Herb**

**Canadian Aquaculture Industry Alliance**

**Canadian Association of University Teachers**

**Central Coast Indigenous Resource Alliance**

**David Suzuki Foundation**

**First Nation Wild Salmon Alliance**

**Fish, Food and Allied Workers - Unifor**

**Fisheries Council of Canada**

**Marty, Gary D.**

**Mordecai, Gideon**

**Oceans North**

**Wild First**

# REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the committee requests that the government table a comprehensive response to this report.

A copy of the relevant *Minutes of Proceedings* (Meetings Nos. 18, 19, 21, 23, 25, 27, 28, 30, 34, 35, 47, 48, 49 and 53) is tabled.

Respectfully submitted,

Ken McDonald
Chair

## Crisis of Trust in DFO Science

Conservative Party Supplementary Report

*Introduction*

On February 1, 2022, the Standing Committee on Fisheries and Oceans (FOPO) passed a motion introduced by MP Mel Arnold for the committee to study how the Department of Fisheries and Oceans (DFO) prioritizes, resources, and develops scientific studies and advice for the department, how the results of scientific study are communicated to the Minister and Canadians, and how the Minister applies data and advice provided by the department and other government departments to ministerial decisions.

Science should be a fundamental factor informing decisions of the Minister of Fisheries and Oceans (the Minister) and DFO. While provisions of the *Fisheries Act* allow for the Minister to exercise discretion and consider multiple factors in making decisions, fisheries and oceans are inherently biological and therefore require science-based assessments, decisions, and strategies if they are to be effectively managed and conserved.

Despite significant investments in DFO science, tangible improvement in management of major stocks is not evident, as some stocks continue to decline, and management decisions have been made in the absence of adequate scientific assessment. The absence of adequate assessments also undermines the ability of the Minister and DFO to identify and make available opportunities that may exist in fisheries capable of supporting sustainable harvest.

Moreover, the weighted values of science and conservation in the decisions, actions and inactions of the Minister and department are repeatedly unclear and unexplained.

After years of witnessing decisions of a series of fisheries ministers and the DFO being announced without science reasons or explanations of factors weighed, Canadians, especially those directly impacted by the decisions, are concerned. Conservatives share these concerns and are motivated to press the government for the answers and change that Canadians deserve.

*Unfulfilled Commitments*

In the 2015 federal election, the Trudeau Liberals presented Canadians with a platform that stated "[g]overnment should base its policies on facts, not make up facts to suit a preferred policy. Common sense, good policy, and evidence about what works should guide the decisions that government makes."[1] This appropriate commitment was seemingly reinforced in the mandate letters of the first two of the five fisheries ministers that held the position since 2015.

While Minister Tootoo[2] and Minister LeBlanc[3]'s mandate letters directed them to "ensure that decisions are based on science, facts, and evidence, and serve the public interest," these

[1] *"A New Plan for a Strong Middle Class,"* Liberal Party of Canada 2015 platform, p. 36.
[2] Mandate Letter to the Minister of Fisheries and Oceans, 12 November 2015.
[3] Mandate Letter to the Minister of Fisheries and Oceans, 19 August 2016.

mandates were absent in the mandate letters of the three fisheries ministers who followed them since 2018.

Today, the promises of the 2015 Liberal platform and first two fisheries ministers' mandates have all but disappeared. Rather than basing decisions on transparent science, facts, and evidence, decisions of the Minister and DFO have increasingly been based on policy for political reasons rather than the benefit of the public interest in sustainable fisheries supporting harvesters and the coastal communities and supply chains they sustain.

Conservatives share the concerns of many Canadians that ideology-driven policy has eclipsed factors of science, conservation, and socio-economic considerations in the decisions made by the Minister as she seeks to fulfill her mandate from the Prime Minister- decisions that have destabilized harvester livelihoods and coastal communities while failing to manage, restore, and conserve fisheries.

**Study Focus 1: How the Department of Fisheries and Oceans (DFO) prioritizes, resources and develops scientific studies and advice for the department.**

In assessing how DFO prioritizes science, it is important to again consider mandates from the Prime Minister to his ministers responsible for managing fisheries and oceans. In every mandate letter since 2015, all five fisheries ministers have been mandated to prioritize ocean or marine science while fisheries science has not been mentioned once.

The Prime Minister's focus on ocean science may serve his political or policy objectives, but it has precipitated an imbalance of priorities and allocations of resources for science in DFO, especially fisheries science. These imbalances have in turn exacerbated science and knowledge gaps directly undermining the ability of the Minister and DFO to make informed management decisions. The absence of fisheries science has led to an increasing reliance on the precautionary principle and several reductions in fisheries access for harvesters and communities that depend on them.

Harvesters raised serious concerns after the Minister reportedly told an annual meeting of the Canadian Independent Fish Harvesters Federation her vision for the east coast fishery is based on her goal of leaving as many fish in the water as possible and to grow as much vegetation in the water as possible so that the Atlantic Ocean can better absorb carbon to combat climate change.[4]

These statements were followed by a news release from Fish, Food and Allied Workers – Unifor (FFAW) that further stated the Minister, "also stated that fish harvesters will have to accept this sacrifice as part of Canada's commitment to fight climate change, noting that given techno-logical advancements, harvesters could change career paths and work remotely from their communities."[5]

[4] "*Fish Harvester Unions Speak Out Against DFO Minister*," FFAW News Release,17 Feb 2022.
[5] Ibid.

After the Minister's statements were raised publicly by FFAW, the Minister's office released a statement saying that her words had been "publicly mischaracterized."[6] However, the Minister has not publicly clarified her statements and decisions she has made before and after her statements about leaving "as many fish in the ocean as possible" seem to reinforce that stated goal.

When asked about these comments when he appeared for the study, FFAW then-President Keith Sullivan testified "I don't think it was mis-construed. We'd heard similar things before and were quite concerned. Our colleagues on the west coast, as Ms. Burridge mentioned, were highly concerned about a decision we had seen on herring. Our members were very concerned about some of the messages we were seeing, and we just wanted to raise our concerns."[7]

The Trudeau government's decision to prioritize ocean science over fisheries science contradicts mandates of the Minister and her department to support sustainable, stable, prosperous fisheries that can "can continue to grow the economy and sustain coastal communities."[8]

In his appearance for this study, Dr. Robert Rangeley of Oceana Canada testified that "DFO must prioritize and resource the increase in capacity necessary to complete fisheries rebuilding plans."[9] Rangeley stated how Oceana's annual fisheries audit found that "only seven of 33 critically depleted stocks—that's about 21%—have rebuilding plans and that most are of poor quality. DFO achieves only 20% of their deliverables laid out in annual work plans, but had they met their priorities, they would have doubled the number of completed rebuilding plans."

"Because of a lack of science resources, the task may be larger than DFO is acknowledging," Rangeley continued. "A new analysis that includes data-poor stocks suggests that the total number in the critical zone may be 58, or 25% of all our stocks, not counting salmon."[10]

In her testimony, Christina Burridge of the BC Seafood Alliance said that "as welcome as the influx of science money has been over the last few years, most of it has gone to ocean science and very little has gone to fisheries science."[11]

"As I'm sure my colleagues will agree, stock assessment, evaluation of the risk and the risk mitigation that fisheries management undertakes are absolutely essential," Burridge stated. "We are seeing that the increased demand on science has grown exponentially."[12]

Burridge also warned that attrition of experienced DFO fisheries stock assessment and technical personnel and absence of any strategy for mentoring the recently graduated next generation of personnel further exacerbates DFO's already-deficient capacities in fisheries science.[13]

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[6] *"N.L. fisheries' union head calls federal minister 'grossly misinformed' over reported climate change comments,"* CBC Online New Story, 22 February 2022.
[7] Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, Evidence, 2 June 2022.
[8] Mandate Letter to the Minister of Fisheries and Oceans, 16 December 2021.
[9] Robert Rangeley, Director of Science, Oceana Canada, Evidence, 14 June 2022.
[10] Ibid.
[11] Christina Burridge, Executive Director, BC Seafood Alliance, Evidence, 2 June 2022.
[12] Ibid.
[13] Ibid.

Burridge went on to explain how much of the increased demands for fisheries science has been precipitated by regulations and legislation and these demands are displacing regular stock assessments that are required for eco-certifications of Canadian fish and seafood.[14]

Eco-certifications have a value-adding affect on fish and seafood and the loss of such certification due to an absence of adequate DFO fisheries science devalues Canadian fish and seafood supply chains from the harvester to consumer.

Moreover, inadequate fisheries science at DFO raises serious questions of how fisheries are managed and conserved by the Minister and department. DFO cannot manage what it does not measure, and the absence of priority and adequate resources for fisheries science at DFO directly undermines the Minister's capacity to lead the department in achieving its stated mandate of "sustainably managing fisheries."[15]

DFO is also mandated to work "with fishers, coastal and Indigenous communities to enable their continued prosperity from fish and seafood."[16] The Trudeau government's failure to ensure DFO has sufficient stock assessments perpetuates continued failures of the Minister and department to identify and grant opportunities that may exist to enable the prosperity of fishers, coastal and Indigenous communities on all coasts.

Harvesters depend on fisheries resources being sustained and have made efforts to fill the science and knowledge gaps in DFO's fisheries science. Keith Sullivan of the FFAW also told the committee that the union "has invested greatly in building a competent science team with full-time scientists and other staff. We know that much of the science has filled gaps left by the federal government. Each year, over 1,000 individuals volunteer their time and knowledge, making meaningful contributions to science."[17]

Jean Côté of the Regroupement des pêcheurs professionnels du sud de la Gaspésie (RPPSG) testified that to answer questions of eco-certification assessors, he conducts an annual analysis of fishing bait and bycatch data using catch data provided by harvester members of his organization.[18]

Despite such efforts and investments of harvester organizations such as these, the committee heard that DFO is not receptive of their work. Côté stated that despite spending over 10 years conducting surveys and analyses of lobster stocks in the Gaspé, DFO has provided no opportunity for his organization to "move towards further collaboration with DFO on data analysis and scientific work done by the RPPSG."[19]

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[14] Christina Burridge, Executive Director, BC Seafood Alliance, Evidence, 2 June 2022.
[15] Government of Canada, Fisheries and Oceans Canada Mandate and Role.
[16] Ibid.
[17] Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, Evidence, 2 June 2022.
[18] Jean Côté, Scientific Director, Regroupement des pêcheurs professionnels du sud de la Gaspésie, Evidence, 2 June 2022.
[19] Ibid.

Sullivan likewise testified that despite his union's investments and contributions to fisheries science, "harvesters still do not have a valued seat at the table, and DFO continues to disregard harvesters and their contributions." [20]

Former DFO Regional Director of Fisheries Management, Morley Knight, echoed the reality that in the absence of essential fisheries science capacities, the DFO does not utilize data from harvesters. Despite being internationally recognized and well-funded, Knight stated that "DFO science is often unable to produce science advice adequate for the management of the fisheries."[21]

Knight pointed to troves of harvester data that remains unused by DFO. "Available information is not always included in the output or in the models, including logbook data or observer data," Knight testified. "There is not enough emphasis on getting harvesters to collect data and samples. Stock status reports are produced without due consideration of anecdotal information from fish harvesters and indigenous groups about the health of the stock."[22]

In discussing DFO's assessment and management decisions for transboundary Atlantic mackerel stocks, retired DFO Senior Fisheries Manager Christopher Jones was asked about whether science and stock management were coordinated between Canadian and US regulators and Jones responded that he is not aware of such coordination.[23]

Jones was then asked whether ocean water temperatures during DFO's spawning biomass surveys assessing the biomass of the Atlantic mackerel stocks are a factor that should be considered.

Jones responded "what it suggests is that it needs broader input into the science assessment. Temperature and egg stock status reference is one. However, years ago and perhaps over a decade ago, we had scientists come along the coasts of both Nova Scotia and Newfoundland, working with the fishing industry, doing measurements and expanding the database for the assessment of mackerel."[24]

Morley Knight also provided perspectives on DFO's assessment of Atlantic mackerel and stated "science programs and scientists are married to theoretical processes and models. These processes fall apart when a survey doesn't get completed or when the models just aren't producing results consistent with a glaring body of evidence that shows the models just aren't producing a reality."[25]

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[20] Keith Sullivan, President, Fish, Food and Allied Workers - Unifor, Evidence, 2 June 2022.
[21] Morley Knight, Former Assistant Deputy Minister, Fisheries Policy, Department of Fisheries and Oceans (Retired), as an individual, Evidence, 7 October 2022.
[22] Ibid.
[23] Christopher Jones, Senior Fisheries Manager, Department of Fisheries and Oceans (Retired), As an individual, Evidence, 14 June 2022.
[24] Ibid.
[25] Morley Knight, Former Assistant Deputy Minister, Fisheries Policy, Department of Fisheries and Oceans (Retired), as an individual, Evidence, 7 October 2022.

"Models use data such as abundance, size at age, maturity, natural mortality, etc., as well as some judgments by scientists, but can never account for all variables such as, for example, unknown changes in the size at maturity," Knight stated. "The models are not always right."[26]

Knight also spoke to the need to ensure "that the ships that scientists need to do their work are operating. They should be made a priority to get the science done, and people should be held accountable for making sure that the program gets delivered."[27]

*DFO Science Resourcing*

The Minister has stated that she is responsible for her department and for fulfilling the mandate provided to her by the Prime Minister, so it is no surprise that apparent priorities reflected in funding decisions of the Minister and DFO dovetail with the mandates issued by the Prime Minister.

Mandate letters from Prime Minister Trudeau to Ministers Tootoo (2015), LeBlanc (2016), and Wilkinson (2018) mandated the ministers to act on Cohen Commission recommendations. However, this mandate was absent in the Prime Minister's mandates to Ministers Jordan (2019) and Murray (2021).

The Cohen Commission was established in 2009 to investigate declines of Fraser River sockeye salmon. In his report released in late 2012, Justice Cohen stated that in assessing impacts of Pacific salmon farms on wild salmon stocks, he had not determined a "smoking gun,"[28] but did accept that "likelihood of harm" exists.[29] In his recommendations, Cohen prescribed focused scientific examination of such impacts and the federal government promptly responded by establishing the Strategic Salmon Health Initiative (SSHI) in early 2013.

The committee received testimony from Dr. Kristi Miller-Saunders who previously led the SSHI and was the only DFO scientist who appeared as a witness for the study. Despite increased funding for DFO science, SSHI's scientific examination of impacts of BC salmon farms on wild salmon was not provided funding to complete the third phase of its four-phase mandate.[30]

For decades, British Columbians, DFO, federal and provincial governments, and salmon farm operators have been confronted with major questions of what impacts BC salmon farms have on wild Pacific salmon- questions that require funded and focused science over time to be answered. This is what Cohen concluded and this why the SSHI was established in 2013, but the Trudeau government has failed to move Cohen's recommendations or the SSHI to completion.

In her testimony to the committee, Dr. Miller-Saunders stated "funding in the department is largely based on competitive proposals. There is the new Pacific salmon strategy initiative. I have not yet received any funding from that strategy, but I anticipate that hopefully I will."[31]

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[26] Morley Knight, Former Assistant Deputy Minister, Fisheries Policy, Department of Fisheries and Oceans (Retired), as an individual, Evidence, 7 October 2022.
[27] Ibid.
[28] *"The Uncertain Future of Fraser River Sockeye,"* Cohen Commission Report- Vol.III, p.88.
[29] *"The Uncertain Future of Fraser River Sockeye,"* Cohen Commission Report- Vol.III, p.21.
[30] Brian E. Riddell, Science Advisor, Pacific Salmon Foundation, Evidence, 28 April 2022.
[31] Dr. Kristi Miller-Saunders, Senior Research Scientist, DFO, Evidence, 26 April 2022.

Miller-Saunders further testified, “I fund my program principally through money outside of the department, because I have better success in generating funds to do my research with outside granting agencies than I do inside the department.”

These statements raise serious questions about how DFO prioritizes resources for science research. If the $647 million Pacific Salmon Strategy Initiative (PSSI) is meant to “stem the devastating historic declines in key Pacific salmon stocks and rebuild these species to a sustainable level,” then why do DFO scientists like Dr. Miller-Saunders need to seek funding from outside of DFO?

The removal of previous ministerial mandates to act on Cohen recommendations and the non-allocation of resources for completing all phases of the corresponding SSHI science work raises serious questions of why the Prime Minister in his mandate letters has abandoned Cohen Commission recommendations and essential science for fisheries management such as investigations that the SSHI was mandated to complete.

*Development of Science Advice*

During its study, the committee received testimony describing how science provided to DFO managers has resulted in science advice to decision makers that does not align with the initial scientific findings of scientists.

The committee was told how DFO scientists “have very little control...or a limited amount of input on what science moves forward to the minister, or even to upper managers in Ottawa, and how they utilize that science.” [32] Jesse Zeman testified that the BC Wildlife Federation “is not concerned with DFO scientists' ability to conduct science. It is concerned with decision-makers and senior managers' willingness to edit, suppress and hide that science.”[33]

Greg Taylor of Watershed Watch Salmon Society DFO previously developed the sustainable fisheries framework (SFF) comprised of “bits and bites of science programmed into policy, and they often provide specific direction to managers.”[34] “Unfortunately,” Taylor continued, “these powerful science-based policies and the management guidance laid out within them are ignored in management decisions.”[35]

“Recent examples of this failure are not hard to find. In 2019, the Canadian fishing industry, after a decade of DFO's promising to implement its national policies, was forced to drop out of its hard-earned certification of sustainability from the Marine Stewardship Council, losing important and key access to world markets,” Taylor stated.[36]

“This year, the minister made an arbitrary decision to cut in half the harvest of herring on the west coast, even though the fishery was consistent with both science advice and policy,” Taylor continued. “Last year, the minister announced the closure of 60% of commercial fisheries. The decision was not founded on a scientific analysis of what fisheries should be closed. In fact,

[32] Dr. Kristi Miller-Saunders, Senior Research Scientist, DFO, Evidence, 26 April 2022.
[33] Jesse Zeman, Executive Director, B.C. Wildlife Federation, Evidence, 28 April 2022.
[34] Greg Taylor, Consultant and Fisheries Advisor, Watershed Watch Salmon Society, Evidence, 28 April 2022.
[35] Ibid.
[36] Ibid.

development of a methodology to decide which fisheries should be closed is only happening now, without direct input from science."[37]

Dr. Andrew Bateman of the Pacific Salmon Foundation testified that "science is not the only decision-making factor at the table." "The decision-makers, as others have mentioned, have to weigh competing or complementary demands, the economy being one of them," Bateman stated. "It's really that the science advice that's presented to the decision-makers, ultimately to the minister, needs to be unfettered by departmental manipulation by mid- and upper-level managers."[38]

More recently, Atlantic Canadians who harvest shrimp in waters of Newfoundland and Labrador's Area 6 have raised their concerns regarding DFO's Species Quota Report[39] that harvesters expect will be followed by a decision reducing harvest opportunities. Again, we see a DFO decisions progressing without adequate fisheries science or assessment.

Adequate science is not consistently available to inform decisions of the Minister and DFO. Witnesses told the committee that even when science advice is provided to decision makers, it does not always directly reflect scientific data submitted by scientists and the process of providing science advice is not transparent.

**How the results of scientific study are communicated to the Minister and Canadians.**

In assessing how DFO communicates science to the Canadians, it is important to again note the 2015 Liberal platform that stated "[w]e will value science and treat scientists with respect. We will appoint a Chief Science Officer who will ensure that government science is fully available to the public, that scientists are able to speak freely about their work, and that scientific analyses are considered when the government makes decisions."[40]

In 2017, Dr. Mona Nemer was appointed to the position of Chief Science Advisor (CSA) and in 2018 was tasked with leading the Independent Expert Panel on Aquaculture (the Panel) in producing a report for the Minister of Fisheries and Oceans and DFO with recommendations on "on the appropriate use of scientific evidence in risk-based aquaculture decision-making, the priority-setting process for aquaculture science at DFO, and the communication of aquaculture science and resulting decisions to Canadians."[41]

When Dr. Nemer appeared as a witness, it was apparent that she had not followed-up with the Minister or DFO on how or if the 19 recommendations of the panel's report have been implemented. "I must say that I have not looked in detail, but I do believe a number of them are still outstanding," Dr. Nemer replied.[42] When asked if she was responsible for following up on whether fundamental questions she was mandated with were answered, Nemer responded,

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[37] Greg Taylor, Consultant and Fisheries Advisor, Watershed Watch Salmon Society, Evidence, 28 April 2022.
[38] Andrew Bateman, Manager, Salmon Health, Pacific Salmon Foundation, Evidence, 28 April 2022.
[39] *Species Quota Report*, DFO Web Page, Updated 26 February 2023 21:09.
[40] *"A New Plan for a Strong Middle Class,"* Liberal Party of Canada 2015 platform, p. 36.
[41] "Report of the Independent Expert Panel on Aquaculture," December 2018.
[42] Mona Nemer, Chief Science Advisor, Office of the Chief Science Advisor, Evidence, 26 April 2022.

"again it's not part of my role and mandate to follow up on what's been implemented in the various departments."[43]

The lone Panel report recommendation that Dr. Nemer confirmed had been implemented was the appointment of DFO's Departmental Science Advisor, Dr. Paul Snelgrove. However, despite being appointed to his position in 2020, it is unclear what Dr. Snelgrove's mandate, role, and responsibilities are within DFO let alone what Dr. Snelgrove has done at DFO since his appointment.

There are no apparent links of collaboration or coordination between Dr. Snelgrove or Dr. Nemer and DFO decisions, including day to day decisions of the department determining science priorities, funding allocations, or communication or science and decisions to Canadians.

It is very troubling that the Chief Science Advisor position was created for purposes of ensuring government science is fully available to the public, that scientists are able to speak freely about their work, and that scientific analyses are considered when the government makes decisions, yet there is scant, if any, evidence of these three objectives being progressed. All of these objectives are necessary, yet the Chief Science Advisor's appearance for our study on science at DFO raised more questions than it answered around how Dr. Nemer is facilitating movement in DFO toward achieving the objectives her role was meant to achieve.

**How the minister applies data and advice provided by the department and other government departments to ministerial decisions.**

We share the concerns of Canadians related to how the Trudeau government and fisheries Minister apply science data and advice to decisions. These concerns are a direct result of years of decisions announced by the government, fisheries ministers and DFO without any scientific analyses cited let alone such science being made available to the public.

Prime examples of such decisions include the 2019 Liberal campaign platform promise to transition salmon farms in British Columbia by 2025 and the first (2020) and second (2023) Discovery Islands decisions. The 2019 campaign promise and 2020 Discovery Islands decision were presented to Canadians with no mention of science or scientific basis- and there should have been. The DFO news release for the 2023 Discovery Islands decision made a single brief reference to "recent science," but still did not describe scientific reasons for the decision, let alone provide the science that was cited.[44]

What is more, neither of the Discovery Islands decisions nor the 2019 campaign promise were announced with any citation or consideration of socio-economic factors considered in the decisions nor a plan to support transitions of Indigenous and non-Indigenous workers and communities in British Columbia directly impacted by these three announcements.

[43] Mona Nemer, Chief Science Advisor, Office of the Chief Science Advisor, Evidence, 26 April 2022.

[44] *"Government of Canada takes action to protect wild Pacific salmon migrating through the Discovery Islands,"* DFO News Release, 17 February 2023.

*Conclusion*

Despite almost eight years of the current government's promises, ministerial mandates, creations of new science advisor positions and the existence of established protocols like the sustainable fisheries framework, successive Ministers of Fisheries and Oceans and the Department of Fisheries and Oceans do not treat science with respect that ensures their decisions are based on science, facts, and evidence, and serve the public interest.

While unfettered scientific analysis and advice is not consistently provided to the Minister and DFO decision makers, major decisions continue to be made- many of them exacting harmful effects on Canadians and communities that depend on fisheries resources.

After years of being marginalized and watching their contributions being ignored by the Minister and DFO, harvesters have little, if any, trust in those whose decisions rule their lives. At the same time, Canadians see some environmental non-government organizations being granted increasing influence in fisheries and oceans policies and decisions.

Taken together, these conclusions make it impossible for Canadians to know what the balance of influence and factors are in fisheries and oceans decisions of the government that was supposed to ensure decisions were based on science, facts, and evidence to serve the public interest. The government's own Chief Science Advisor cannot account for whether she has delivered on the supposed objectives of her role including ensuring decisions consider scientific analysis and ensuring science is provided to Canadians.

The crisis of trust that exists between the regulated and the regulator in Canada's sphere of fisheries and oceans must be dealt with and this must be led by the Minister.

It would be appropriate and helpful for the Minister to provide Canadians with a clear commitment of ensuring her decisions and those of her department will be based on science, facts, and evidence, and serve the public interest. The Minister could also build public confidence in decisions she and her department make by committing to making science related to those decisions fully available to Canadians.

Managing fisheries, oceans and aquatic habitats is complicated, but better outcomes and relationships can be achieved if the Minister takes a personal interest in providing greater transparency and accountability by driving the improvement that DFO desperately needs in its science capacities and processes, decisions, and relationships that it, as the regulator, ought to foster and respect.

Those living and working under the authority of the Minister and DFO are not just the regulated, they are Canadians who sustain families and communities; they deserve to be informed and they deserve to be heard.