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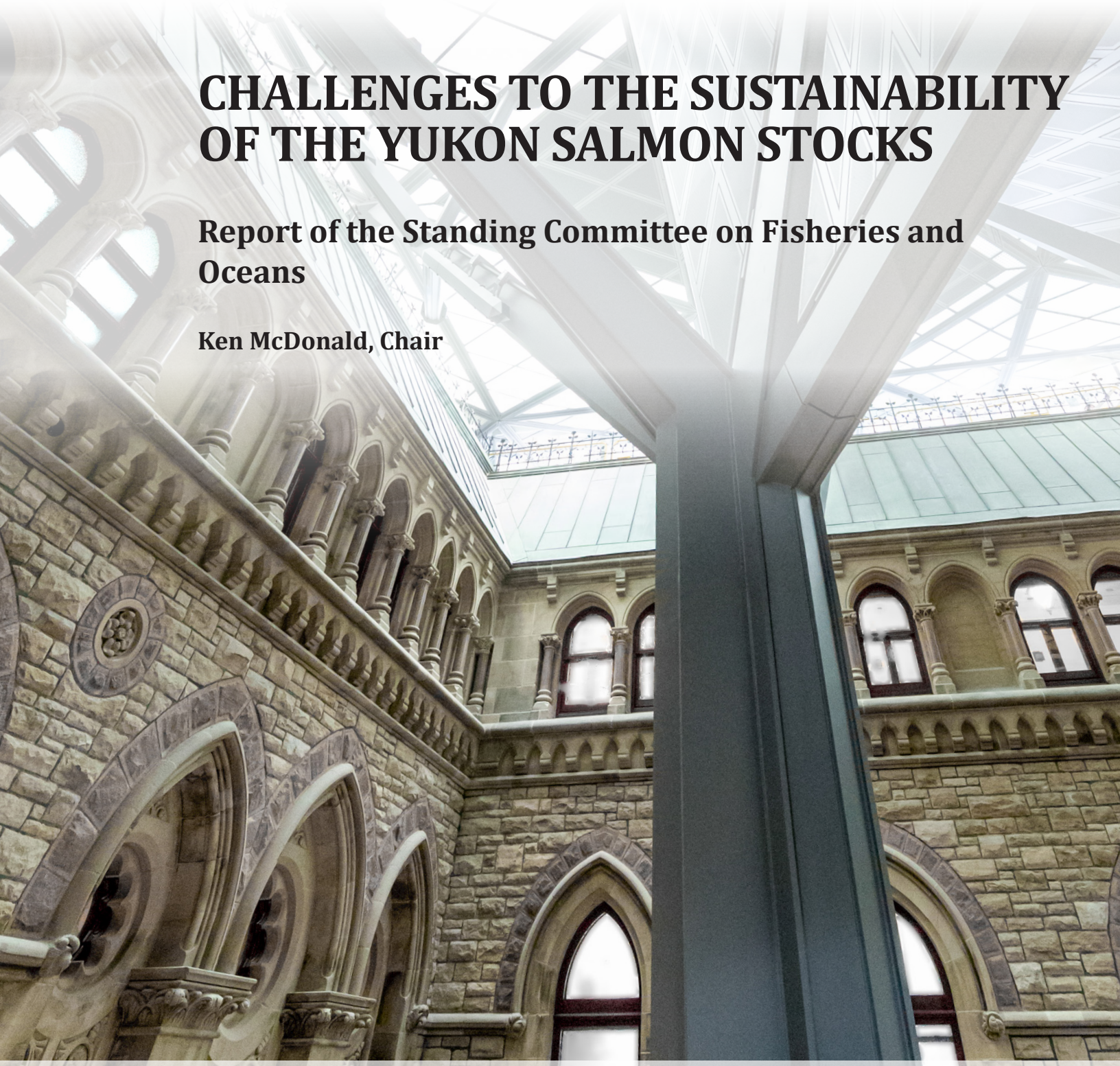

CHALLENGES TO THE SUSTAINABILITY OF THE YUKON SALMON STOCKS

Report of the Standing Committee on Fisheries and Oceans

Ken McDonald, Chair

OCTOBER 2024
44th PARLIAMENT, 1st SESSION

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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.

To assist the reader:
A glossary of terms used in this report is available on page ix

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THE STANDING COMMITTEE ON FISHERIES AND OCEANS

has the honour to present its

SEVENTEENTH REPORT

Pursuant to its mandate under Standing Order 108(2), the committee has studied the population sustainability of Yukon salmon stocks and has agreed to report the following:

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GLOSSARY

Canadian-origin salmon: Salmon produced in Canadian streams. In Yukon transboundary rivers, Canadian-origin salmon must swim through the American section of the river before reaching their natal stream in Canadian waters to spawn.

Escapement: Spawning escapement refers to "the portion of an adult returning salmon run that spawns on spawning grounds by avoiding harvest in any fisheries – including subsistence, First Nation, commercial, personal use, domestic and sport/recreational."[1] Escapement numbers can be used to establish stock status and the number of salmon potentially available for harvest.

Interception: Salmon migrate long distances to complete their lifecycles and can cross international borders. As a result, Canada and the United States (U.S.) have a common challenge: salmon produced (i.e., spawned) in one country's waters can be caught by fishers in the other country. The concept of "interception" is therefore defined as the "harvest of one country's salmon by another's [fishers]."[2]

1 Yukon River Drainage Fisheries Association and Yukon River Panel, *Yukon River Salmon Agreement Handbook: Information and Reference Materials*, June 2005, p. 16.

2 Pacific Salmon Commission, *The Pacific Salmon Treaty*.

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 1

Given that salmon is essential to the food security and community health of First Nations and that the decline of salmon populations threatens First Nations' rights under the *United Nations Declaration on the Rights of Indigenous Peoples* to self-determination and traditional ways of life, that the Government of Canada uphold First Nations rights through appropriate management decisions. 20

Recommendation 2

That Fisheries and Oceans Canada recognize that a fundamental threat to the salmon population is climate change and that every measure adapted to these changes be taken without further delay to preserve the threatened species as quickly as possible. 23

Recommendation 3

That the Minister of Fisheries, Oceans and the Canadian Coast Guard, Fisheries and Oceans Canada, the Minister of Foreign Affairs and Global Affairs Canada work with international counterparts that manage Pacific salmon fisheries to study how wild Pacific salmon are impacted by large-scale hatchery releases of Pink and Chum salmon into the North Pacific ecosystem by countries including the United States, Japan, Korea and Russia. 24

Recommendation 4

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and Fisheries and Oceans Canada, in cooperation with the governments of Alaska and the United States, assess impacts of pinniped predation on Pacific salmon stocks of Canadian origin and enable management measures necessary to support stock recoveries. 25

Recommendation 5

Given that conflicting testimony has been provided regarding the impact of ocean bycatch and how this is impacting numbers of salmon returning, it is critical that Fisheries and Oceans Canada either launch or support an independent review of this work in an effort to address disparities in witness testimony regarding the role of bycatch and the information received from the National Oceanic and Atmospheric Administration via Fisheries and Oceans Canada officials. 27

Recommendation 6

That the Government of Canada obtain information from the relevant bodies in the United States regarding the number of salmon caught as bycatch in the US pollock fishery, and report this information publicly in Canada through Fisheries and Oceans Canada. 27

Recommendation 7

The *Yukon River Salmon Agreement* should be extended to considerations of the ocean-side harvest, where testimony indicated that the 'abundance' offshore did not translate into salmon returns to the river..... 27

Recommendation 8

That the Government of Canada act urgently, as a responsible partner to provincial and territorial governments, to protect and restore watersheds that are threatened by the climate crisis and environmental degradation caused by human activity. 29

Recommendation 9

The Government of Yukon and the Government of Canada should develop a water management strategy for the Yukon River to address low water levels and that impact on salmon spawning areas. 29

Recommendation 10

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and Fisheries and Oceans Canada prioritize establishing adequate monitoring and enforcement to combat illegal, unreported and unregulated fishing of Pacific salmon stocks of Canadian origin. 30

Recommendation 11

That the Government of Yukon, in collaboration with Fisheries and Oceans Canada, increase efforts to establish that monitoring of placer miner effects on salmon spawning grounds by the Government of Yukon and Fisheries and Oceans Canada are fully compliant with the Fish Habitat Management System..... 32

Recommendation 12

That the Government of Canada work urgently with the Government of Yukon to settle jurisdictional disagreements as they relate to the health and wellbeing of Yukon salmon populations, and where necessary strike new agreements to ensure that all gaps in regulatory oversight are closed. 32

Recommendation 13

The Government of Yukon should review its environmental assessments and regulations for placer mining operations, and the impact they have on water quality in the rivers. 32

Recommendation 14

That Fisheries and Oceans Canada, in partnership with Natural Resources Canada and, as necessary, Environment and Climate Change Canada, explore in collaboration with provincial and territorial bodies the impact that abandoned mines may be having on salmon populations in the watersheds within this biosphere, in particular, the risks from the leakage and runoff including from BYG in Yukon and the Tulsequah Chief Mine in BC, and that findings from this exercise be reported back to the Committee. 32

Recommendation 15

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and Fisheries and Oceans Canada work closely with the Government of Yukon and the governments of Alaska and the United States to ensure adequate protection of wild salmon habitats. 33

Recommendation 16

That the Government of Canada meaningfully and if needed, financially, contribute to the Kwanlin Dün First Nation as part of the Whitehorse Fishway Redevelopment project, honouring our Treaty Obligation 16.3.2.2 of the Kwanlin Dün Final Agreement. 35

Recommendation 17

That the Government of Canada work with stakeholders to modernize infrastructure along the Yukon River, such as improving fish ladders and other changes recommended under a stock restoration initiative. 35

Recommendation 18

That the Government of Canada undertake negotiations with the Government of the United States or the Government of Alaska to ensure that BC and Alaskan management measures regarding salmon are aligned, and are ecosystem-based. 36

Recommendation 19

That the Government of Canada undertake negotiations with the Government of the United States or the Government of Alaska to end intercept fishing in Alaskan fishery district 104. 36

Recommendation 20

That the Government of Canada prioritize ending unsustainable intercept fishing as a reconciliation measure, in light of the impacts that interceptions have on First Nations on the West Coast of Canada. 37

Recommendation 21

That the Government of Canada sufficiently increase the funding and resources available to invest in the concrete measures as determined by experts and stakeholders to be necessary to reverse the decline in Yukon River Salmon. 38

Recommendation 22

That efforts by all parties to address the declining salmon populations consider habitat restoration, combating and mitigating the effects of climate change, overcoming or mitigating the effects of man-made obstructions in the routes taken by the salmon and other measures deemed impactful in this project. 38

Recommendation 23

That the Government of Canada recognize the impact that climate change is having on ocean and river health, including its impacts on the Yukon River Salmon and other species, and that the Government of Canada work collaboratively with other levels of government and across jurisdictions to support comprehensive action to reverse, combat and mitigate the impacts of climate change as part of its response to restoring the sustainability of Yukon River Salmon. 38

Recommendation 24

That the Government of Canada provide sufficient attention and resources to monitoring individual conservation units of Yukon salmon, as more fine-grained monitoring of returns is necessary to prevent local level extinction and biodiversity loss. 39

Recommendation 25

That Fisheries and Oceans Canada make management decisions as close to the ground as possible by consulting communities and relevant stakeholders directly impacted by the species' decline to ensure the best data is obtained to improve territorial management, so that the right decision is made in the right place and overall consistency is encouraged. 40

Recommendation 26

That the Government of Canada increase its funding commitment through Fisheries and Oceans Canada to allow more resources and focus to be directed towards monitoring and data collection of Yukon River and Northern BC salmon. 40

Recommendation 27

Given that there are many examples of First Nations taking the lead in protecting and conserving local salmon stocks for generations to come, that Fisheries and Oceans Canada work alongside First Nations to implement traditional knowledge and practices in Yukon salmon management and rebuilding strategies. 41

Recommendation 28

That the Government of Canada enhance investments in First Nations community-based stewardship efforts including conservation and monitoring work, with an emphasis on sustainable and predictable multi-year programming. 41

Recommendation 29

That the Government of Canada work collaboratively with the governments of the United States, the State of Alaska, Yukon and the governments of relevant First Nations and American Indian communities, along with relevant stakeholders, to balance science and traditional knowledge in developing and implementing a plan to reverse the decline in Yukon River Salmon (Chinook) populations (and launch stock restoration initiatives). 41

Recommendation 30

That the Government of Canada work collaboratively with Yukon First Nations to honour and continue meaningful efforts towards implementing Final Agreements, in particular those components related to the conservation and protection of Yukon River Salmon. 42

Recommendation 31

That the Government of Yukon, in collaboration with Yukon First Nations and Fisheries and Oceans Canada, develop the Kwanlin Dün First Nations Salmon Stewardship Centre, which will include a feasibility study for a Yukon-based conservation hatchery for Yukon Salmon. 43

Recommendation 32

That the governments of Canada and the United States, in collaboration with the governments of Yukon and Alaska, shift from the current *Yukon River Salmon Agreement* focussed on border passage towards developing a comprehensive binational agreement with a goal of restoring and rebuilding Yukon River Salmon and its supporting ecosystem. 44

Recommendation 33

That the Government of Canada amplify cross-border work with the governments of Alaska and the United States on conservation initiatives and fisheries control measures that will help to ensure a future for wild Pacific salmon and the future implementation of a fair and sustainable *Yukon River Salmon Agreement*. 44

Recommendation 34

That the Government of Canada conduct negotiations to ensure that exemptions for First Nations to the 7-year Yukon Chinook Moratorium, if considered, are applied equitably on both sides of the border, with adequate consultation in all cases. 44

Recommendation 35

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and the Government of Canada begin the work to renegotiate the *Yukon River Salmon Agreement* with the United States to better reflect current realities including consideration to refocusing the metrics that are currently based solely on escapement size to include other metrics including the size, sex and age of the fish, as well as recognizing and incorporating traditional knowledge into assessment and decision-making. 44

Recommendation 36

That the Minister of Fisheries, Oceans and the Canadian Coast Guard, Fisheries and Oceans Canada and other ministers and departments increase international diplomatic actions to ensure treaties and agreements for the management of Pacific salmon:

- **establish fisheries management and regulations supporting sustainability and conservation of stocks of Canadian origin, especially stocks of concern;**

- **ensure Indigenous communities in Canada and Canadian harvesters have priority of access to salmon stocks of Canadian origin. 45**

Recommendation 37

That any part of a response to preserve and protect Yukon River Salmon and Northern BC Salmon also provide support for relevant education about the importance of salmon for residents and visitors, including children and youth. 46

CHALLENGES TO THE SUSTAINABILITY OF THE YUKON SALMON STOCKS

INTRODUCTION

On 16 June 2022, the House of Commons Standing Committee (the Committee) adopted a motion to undertake a study

> examining population sustainability of [P]acific salmon stocks in the Alsek, Porcupine, and Yukon River drainages that would include:
>
> - a briefing with officials from Fisheries and Oceans Canada to provide an update on the Pacific Salmon Strategy Initiative;
> - threats to the sustainability of the [P]acific salmon species and the importance of salmon harvesting to First Nations across Yukon;
> - the dynamics of the *Pacific Salmon Treaty* with the United States and in particular the *Yukon River Salmon Agreement*, and their role in the conservation and stewardship, enhanced hatchery production, harvest transformation and integration, and collaboration on which the Pacific Salmon Strategy Initiative is built;
> - the impact of predation, climate change and other factors on salmon stocks.[1]

On 15 February 2024, the Committee agreed to hear two hours of witness testimony "focused on transboundary issues related to the long-term health of [British Columbia] BC wild salmon populations" as part of this study.[2] Many issues affecting wild Pacific salmon in both the Yukon and BC are discussed throughout this report, which also includes a section specific to British Columbia's waters to discuss the situation there.

Between 15 February 2024 and 13 June 2024, the Committee heard from 19 witnesses and received six briefs. Witnesses represented the federal and territorial governments, Yukon First Nations and Alaska Natives, non-governmental organizations, scientists as

1 House of Commons, Standing Committee on Fisheries and Oceans (FOPO), *Minutes of Proceedings*, 16 June 2022.

2 FOPO, *Minutes of Proceedings*, 15 February 2024.

well as current and former members of some of the committees responsible for managing Yukon Salmon, such as the Yukon Salmon Sub-Committee.

The Committee thanks the witnesses for their contributions. In particular, the Committee would like to thank the witnesses from Yukon First Nations who shared the significant impacts the decline of Pacific salmon is having on their communities, including the ability to pass knowledge and cultural significance of the role of salmon to future generations.

This report begins by providing an overview of the decline of wild Pacific salmon in the Yukon. It describes the importance of Yukon Pacific salmon to Yukon First Nations and Alaska Natives and the impacts of declining salmon populations on their communities. The report then discusses potential causes of Pacific salmon decline in ocean and freshwater environments and how to address them. Lastly, it examines other tools and paths forward for the protection of wild Pacific salmon.

WILD PACIFIC SALMON IN THE YUKON

Pacific salmon hatch from eggs laid in freshwater streams. Some species of Pacific salmon migrate quickly from stream to ocean while others spend years in freshwater before migrating downstream. Juvenile Pacific salmon mature in the ocean before migrating back upstream to reproduce in the same freshwater streams in which they were born. Once they have reached their natal streams and spawn, thousands of fertilized eggs are deposited in depressions dug into the gravel. For every thousand fertilized eggs, only a few survive to adulthood. Pacific salmon die after reproducing.

Steve Gotch, Senior Director of Operations for the Pacific Region of Fisheries and Oceans Canda (DFO), gave the following description of Pacific salmon in the Yukon:

> Many populations of Pacific salmon in Yukon represent the northernmost range for their species. Unlike other Pacific salmon stocks, which inhabit more southern and temperate regions of western North America, over millennia salmon stocks in the Yukon have adapted to survive in often harsh subarctic conditions. As a result, many of these stocks represent the longest-lived and largest body size of their species, in many cases enabling them to migrate several thousand kilometres inland from the ocean to access spawning areas in freshwater habitats.[3]

The Yukon River watershed is very large: it is 25% larger than the entire province of Alberta (figure 1).[4] Bathsheba Demuth, Dean's Associate Professor of History and

3 Steve Gotch, Senior Director, Operations, Pacific Region, Fisheries and Oceans Canada (DFO), *Evidence*, 18 April 2024.

4 David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

Environment and Society at Brown University, appearing as an individual, told the Committee that Chinook salmon are "absolutely critical to the basic ecological function of [the Yukon River watershed] in a way that's difficult to underestimate" since they "bring the nutrients of the Bering Sea thousands of kilometres inland to ecosystems that otherwise don't have access to them."[5] The nitrogen brought into the headwaters of the Yukon River is important for the boreal tree species that line the riverbank, such as spruce, and for the "very small invertebrates in the stream systems all the way up through to bears, eagles."[6]

Figure 1—Map of the Alsek, Porcupine, and Yukon River Watersheds

Source: Map prepared by the Library of Parliament, Ottawa, 2023, using data from Government of Yukon, *Watersheds – 1M*, 2022; Natural Resources Canada, *North American Atlas – Watersheds*

5 Bathsheba Demuth, Dean's Associate Professor of History and Environment and Society, Brown University, As an individual, *Evidence*, 15 February 2024.

6 Ibid.

(FTP), 10M, 2019; Natural Earth, *Cultural Vectors – Populated Places*, 10M, version 5.1.1, *Cultural Vectors – Admin 0 – Countries*, 10M, version 5.1.1, and *Physical Vectors – Rivers + lake centerlines*, 10M, version 5.1.1. The *Terrain: Hillshade* layer is the intellectual property of Esri and is used under licence, © 2022 Esri and its licensors. All rights reserved. The following software was used: Esri, ArcGIS Pro, version 3.0.2.

Chinook salmon are the largest species of salmon found in Canada, weighing up to 90 pounds. Yukon Chinook salmon spend up to two years in freshwater and one to six years in the ocean before returning to spawn. About 50% of Chinook salmon in the Yukon River are Canadian-origin. Chinook salmon migrations enter the Yukon River between mid-May and mid-July and reach the Canada/U.S. border, almost 2,000 kilometers upstream, between early July and mid-August.

Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources for Kwanlin Dün First Nation, explained how Indigenous tribes on the Alaskan side of the Yukon River knew they had caught Canadian-origin Chinook because "they were oilier, heavier and relatively larger in size."[7] Dennis Zimmerman, Fish and Wildlife Consultant at Big Fish Little Fish Consultants and *Pacific Salmon Treaty* Panel Member, appearing as an individual, described Yukon River Chinook as "historically large, old and prominent," since returning adults travel more than 3,000 km in the river to their spawning grounds in Canada.[8]

Yukon River Chinook have "over 100 documented spawning locations."[9] Stephanie Peacock, Senior Analyst at the Pacific Salmon Foundation, shared that Canadian-origin Yukon Chinook salmon are

> not just a uniform group of fish but one comprised of 12 genetically and ecologically distinct populations called "conservation units". Each of these conservation units has a unique evolutionary history and is an irreplaceable unit of biodiversity. Conserving this diversity within Yukon chinook is essential for resilience in the face of climate change.[10]

Witnesses also regularly discussed Chum salmon. Chum salmon are the most widely distributed Pacific salmon species. Yukon Chum salmon migrate to the ocean shortly

7 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

8 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024.

9 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

10 Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

after emerging from the gravel and return to spawn after two to six years in the ocean. Fall Chum salmon weigh an average of seven to eight pounds.

Sonar is used to detect Pacific salmon migrating to spawn in the Yukon River and its tributaries. The Alaska Department of Fish and Game (ADF&G) in the U.S. operates a sonar station near Pilot Station, Alaska, approximately 200 kilometers upstream from the Bering Sea. Salmon reach this station in roughly two to three days and only one spawning tributary is below the sonar station. DFO and ADF&G operate another sonar station near Eagle, Alaska, almost 2,000 km upstream from the Bering Sea. It is approximately 30 kilometres from the Canada-U.S. border. Counts from Eagle Station are used as the count of salmon crossing into Canadian waters.[11]

Decline of Wild Pacific Salmon in the Yukon

The Committee heard that the decline of Pacific salmon has been of concern for many years. David Curtis, documentarian and fisherman, appearing as an individual, shared that communities "along the upper portion of the [Yukon River], along with scientists and activists, have for decades been sounding the alarm about how chinook salmon are on the precipice of extinction."[12] Many witnesses described Yukon salmon as being in a state of crisis.[13]

Elizabeth MacDonald, Manager of Fisheries for the Council of Yukon First Nations, shared that Chinook salmon have "been experiencing widespread declines and changes for some time. Traditional knowledge-keepers in the communities say this decline started before western science [identified the decline] in the 1980s."[14] Chum salmon are also "experiencing a long-term depressed population."[15] The Committee heard that a "catastrophic collapse" or "salmon crash" occurred in the Yukon River in 2020, affecting both Chinook and Chum.[16] In 2022 and 2023, only approximately 12% of the average

11 Alaska Department of Fish and Game (ADF&G), *Yukon (Pilot) River*; and ADF&G, *Yukon (Eagle) River*.

12 David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

13 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024; Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 15 February 2024; Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024; and Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

14 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

15 Ibid.

16 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024; and David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

number of Chinook salmon were detected at the mouth of the Yukon River, with 40% of those fish dying before reaching the Canadian border. Four of the five lowest spawning estimates since 1980 for Chum salmon have occurred between 2020 and 2023. Only about 20% of the average number of Chum salmon have reached the Canadian border each year since 2020.[17]

Witnesses shared dire numbers from the 2023 season with the Committee including that:

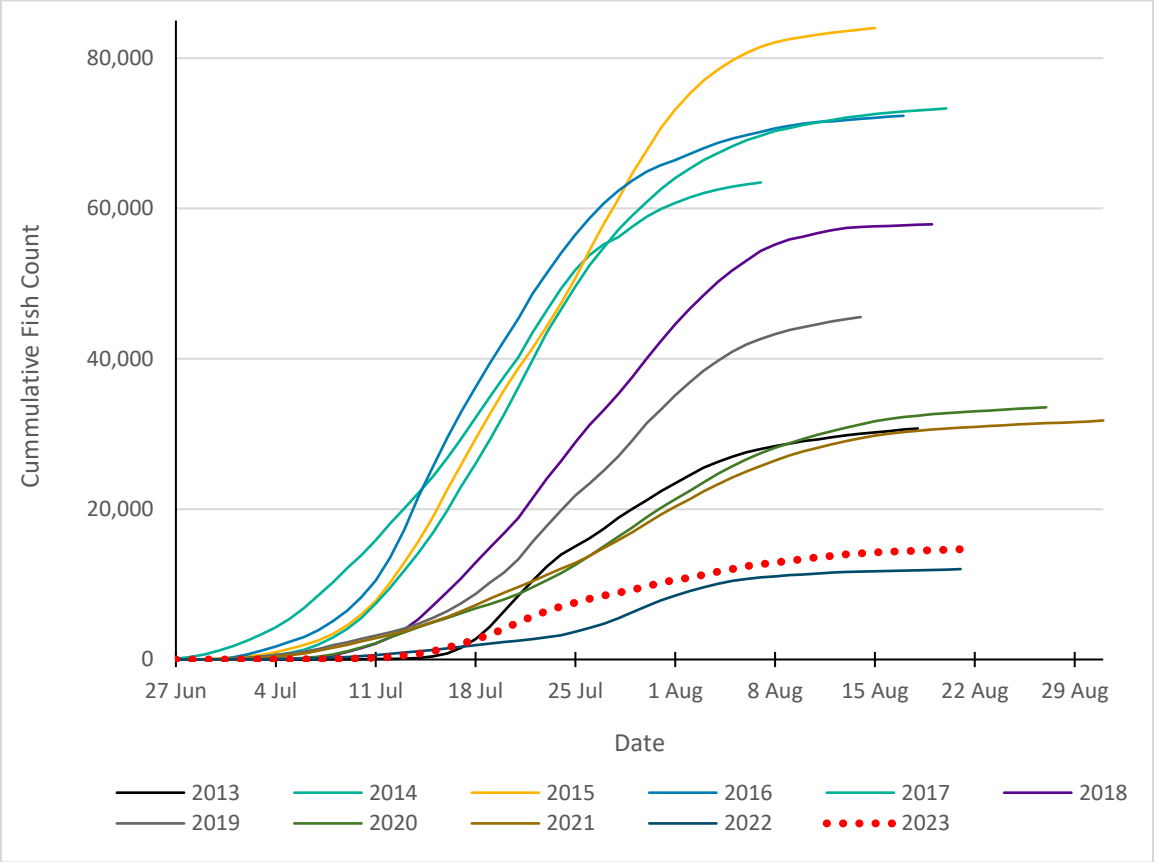
- The pre-season estimate prepared by the Yukon River Joint Technical Committee was for 26,000 Yukon River Chinook to enter Canada, but only 15,304 Yukon River Chinook entered Canada;
- Just over 350 Chinook salmon were detected in the Takhini River, a tributary to the mainstem Yukon River; and
- 54 Chinook passed through the Whitehorse fish ladder, the lowest count ever.[18]

Figures 2 and 3 show the daily cumulative passage of Chinook and Chum salmon at the Canada-US border between 2013 and 2023.

17 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

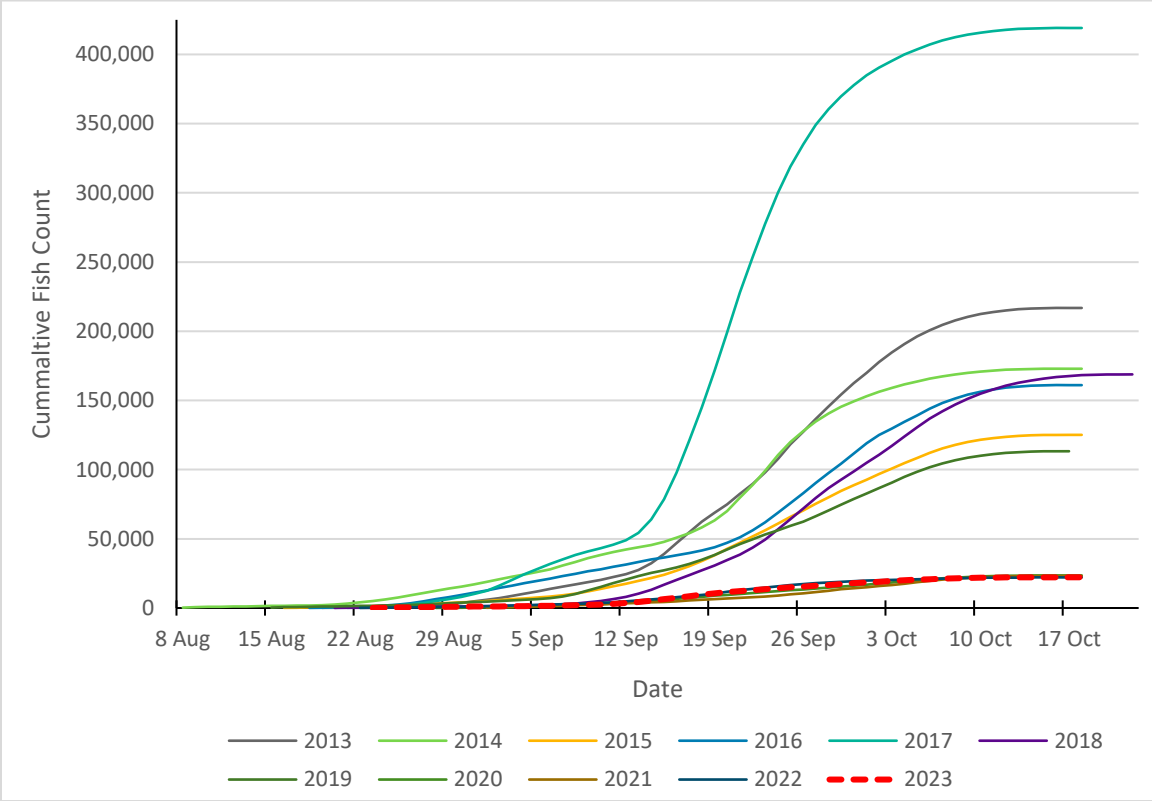
18 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024; David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024; and Hon. Nils Clarke, Minister of Environment, Government of Yukon, *Evidence*, 13 June 2024.

Figure 2—Cumulative Daily Passage of Chinook Salmon at Eagle Sonar (Canada/United States Border) Between 2013 and 2023



Source: Alaska Department of Fish and Game, "Daily Escapement Table," *Escapement Monitoring Inseason and Historical Data Yukon Management Area*.

Figure 3—Cumulative Daily Passage of Fall Chum Salmon at Eagle Sonar (Canada/United States border) Between 2013 and 2023



Source: Alaska Department of Fish and Game, "Daily Escapement Table," *Escapement Monitoring Inseason and Historical Data Yukon Management Area*.

In April 2024, the forecasts for the 2024 season were "extremely poor," with fewer than 20,000 fish expected to return to the Canadian portion of the Yukon River.[19]

Not only are fewer wild Pacific salmon returning to Yukon rivers than before, but the fish themselves are smaller. Chief Nicole Tom of Little Salmon Carmacks First Nation described how returning wild Pacific salmon are "smaller and have more scars and softer meat" than they had in the past.[20] Tim Gerberding, Chair of the Yukon Salmon Sub-Committee, shared that "[t]he salmon that are coming back now are about half the size of the salmon that

19 Steve Gotch, Senior Director, Operations, Pacific Region, DFO, *Evidence*, 18 April 2024.

20 Chief Nicole Tom, Little Salmon Carmacks First Nation, *Evidence*, 15 February 2024.

returned 30 years ago."[21] While Yukon River Chinook used to be "plump and robust, with bulging bellies and voluminous egg-sacks," they are now shaped more like torpedoes.[22] This has an impact on productivity since older, larger fish have more eggs and are more fecund.[23] Additionally, smaller salmon may not have the energy reserves needed to make the 3,000 km journey up the Yukon River.[24]

Chinook salmon are also returning to the Yukon River to spawn earlier than before. Chinook salmon previously returned to the river to spawn at seven or eight years old. It is now common to find three- to four-year-old fish returning to spawn.[25] The Committee heard that, while environmental conditions may play some role in signalling an earlier return to the river, there is likely a genetic component as well. The genetic makeup of Yukon Pacific salmon has been changing over recent years. This could be because more dangerous ocean conditions are making it unlikely that fish will survive for many years in the ocean or because gill netting with large meshes has targeted large salmon and removed those genes from the stocks.[26]

THE IMPORTANCE OF WILD PACIFIC SALMON TO YUKON FIRST NATIONS AND THE IMPACTS OF THEIR DECLINE

For thousands of years, wild Pacific salmon have been an important food source and a significant cultural symbol for Yukon First Nations. Declining salmon returns have impacted food security, the mental and physical health of community members, and the ability to pass on traditional knowledge and culture to the next generation. Over 50 communities "that depend in some way on Yukon River Chinook in Alaska and Yukon are suffering, no longer fishing, and, most importantly, losing their connection to salmon culture."[27]

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21 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

22 Tim Gerberding, Yukon Salmon Sub-Committee, *Standing Order 108(2) - Study Examining Population Sustainability of Pacific Salmon*, Brief submitted to FOPO, 12 February 2024; and Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

23 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024.

24 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

25 Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

26 David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024; and Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

27 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024.

Members of Yukon First Nations and Alaska Natives gave compelling testimony describing the impacts of the decline of Yukon River salmon on their communities.

Chief Nicole Tom described the crucial importance of fish camps for Northern Tutchone identity, where migrating Pacific salmon are caught and preserved:

> Our family would gather elders, children, youth, mothers, fathers, aunties and uncles, and our family bonds were solidified. Language, traditional laws, cultural values and oral stories were transferred from one generation to the next. This was the centre of the Northern Tutchone identity, tied to our keystone species, the chinook salmon, and our keystone place, the Yukon River. There is a physical, mental, emotional and spiritual connection to a fish camp. The whole process from beginning to end is hard work. Physically, you are actively engaged with the water, setting net and carrying out various duties to run the fish camp. Mentally, you have time to reflect and concentrate on your well-being. You must be sober and in good mental health so as to not pass on any negativity to the salmon preparation for your family. Emotionally, your cup is full of laughter, wisdom, joy and love shared with the environment, salmon and family. Spiritually, you are paying respects to the original agreements with the salmon by following your traditional laws and values.[28]

She also described how declining salmon numbers are impacting this tradition:

> Our families and our community are in what I call a collective trauma state. It's a heart wound. It's a soul wound. It's affecting everything that we are. We are Little Salmon Carmacks people. Without salmon, where are we going to go? We've been infiltrated by the gold rush and residential schools, and we have a lot of things that have already been taken from us and lost. At this point, the culture, which is the epitome of our whole nation, is also being lost, and that's the salmon. There are so many things that play into the fish camp, and at this point our fish camps are left empty—and you can see it all down the Yukon River. This has been happening for very many years, and it's absolutely devastating to our people. Our children, at Christmastime, made a Santa Claus, and they were asked to ask Santa what they would like. In that Santa Claus's arms was a huge Chinook salmon, so all of those children are so feeling that devastation that they wrote Santa and asked for the salmon to come back. Our elders, who are used to the vitamin D and all these wonderful omegas that come from it, they're feeling it in their bones. They just want to have the salmon so badly.[29]

Brandy Mayes told the Committee that

> Yukon River chinook salmon in Kwanlin Dün First Nation traditional territory have been depleted to a point that our citizens have voluntarily reduced or completely withdrawn from harvesting salmon. … The impacts to our culture, our people's health, food security

28 Chief Nicole Tom, Little Salmon Carmacks First Nation, *Evidence*, 15 February 2024.

29 Ibid.

> and the ecosystem, and thereby bears, eagles and others that depend on these returns, are devastating.[30]

Chief Rhonda Pitka from Beaver Village Council described the impacts on Beaver, Alaska, a small fly-in-only community on the Alaskan portion of the Yukon River just south of the Arctic Circle, as follows:

> Over the past 20 years we have seen stocks of Yukon River chinook and chum salmon obliterated by numerous challenges, all of human origin, all originating from outside our small communities along the Yukon River. As the stocks of salmon have dwindled, our food security has become imperiled. The smokehouses that used to be filled with a winter's supply of salmon sit empty. Our children's critical link to our food culture and way of life has been severed. We have not had salmon for funeral potlatches for our people. In the last four years of no harvest, this crucial religious and cultural ceremony need has not been met. There are not enough salmon to feed my community or the communities of the Upper Yukon River in Alaska that I represent or our relatives in Canada along the Yukon River and Porcupine River. That much is clear. We have not fished in the last four years. We have not had a subsistence harvest that has met our needs.[31]

She described how since the "vast majority of our people depend so heavily on the Yukon River salmon—not only as a source of food, but as a source of culture—that the crashes have devastated our communities in a lot of different ways," including through an increase in the rates of prediabetes in the community. A "rise in domestic violence" was noted as an example of the "social effects happening with the dwindling of resources."[32] Chief Rhonda Pitka also described the efforts undertaken and the costs incurred to change the mesh size of the nets used by the community.[33]

Chief Pauline Frost from Vuntut Gwitchin First Nation shared that 2023 "was the first time in [Vuntut Gwitchin First Nation] history we actually had to buy fish out of B. C. and fly them into our community so we can keep the culture alive."[34]

The Committee heard that Yukon First Nations and Alaskan Natives have reduced the number of salmon they harvest for many years.[35] Witnesses highlighted that the

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30 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

31 Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 30 May 2024.

32 Ibid.

33 Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 15 February 2024.

34 Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

35 Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 15 February 2024; and Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

moratoriums and harvest restrictions introduced as conservation efforts had heavily affected Yukon First Nations and Alaska Natives while commercial fishing in the ocean was not subject to these restrictions.[36]

Recommendation 1

Given that salmon is essential to the food security and community health of First Nations and that the decline of salmon populations threatens First Nations' rights under the *United Nations Declaration on the Rights of Indigenous Peoples* to self-determination and traditional ways of life, that the Government of Canada uphold First Nations rights through appropriate management decisions.

AGREEMENTS RELATED TO YUKON RIVER SALMON

The *Pacific Salmon Treaty* and the *Yukon River Salmon Agreement*

In 1985, Canada and the U.S. signed the *Pacific Salmon Treaty* (the Treaty). In signing the Treaty, the countries "agreed to cooperate in the management, research and enhancement of Pacific salmon stocks of mutual concern."[37] The Treaty also committed both countries to manage their fisheries to

- prevent over-fishing and provide for optimum production, and
- ensure that both countries receive benefits equal to the production of salmon originating in their waters.[38]

The Treaty has been renegotiated and resigned since 1985. The most recent ten-year agreement was signed in 2018.

Pursuant to the Treaty, the *Yukon River Salmon Agreement* (YRSA) was concluded in December 2002[39] and was specific to the Yukon River salmon stocks. The YRSA is now

36 Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 30 May 2024; Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024; and Aaron Hill, Executive Director, Watershed Watch Salmon Society, *Evidence*, 2 May 2024.

37 Pacific Salmon Commission, *The Pacific Salmon Treaty*.

38 Ibid.

39 The *Yukon River Salmon Agreement* was concluded in March 2001 but was only recognized as an official agreement by the Canadian and United States' governments in December 2002. See: Yukon River Drainage Fisheries Association and Yukon River Panel, *Yukon River Salmon Agreement Handbook: Information and Reference Materials*, June 2005.

enshrined in the *Pacific Salmon Treaty* as Chapter 8 of Annex IV. The YRSA does not have a pre-determined timeframe for its renegotiation or review.

As Steve Gotch explained,

> [DFO] engages directly with state and federal fishery management agencies in Alaska to coordinate the assessment and management of [Pacific salmon stocks in the Yukon]. This engagement also involves working together to implement formal processes and requirements established within the international U. S.-Canada [*Pacific Salmon Treaty*].[40]

On April 1st 2024, "following months of intensive negotiations," DFO and the State of Alaska signed an agreement (the April 1st agreement) to "implement measures to protect and recover Canadian-origin salmon stocks."[41] Steve Gotch described it as follows:

> The agreement involves the immediate suspension of all fisheries that target Canadian-origin chinook salmon stocks in the Yukon; confirms the parties' intent to support scientific, technical and traditional knowledge research into the causes for decline; and commits the parties to development of an international stock rebuilding plan through the Yukon River Panel. This agreement will remain in effect for a seven-year period, which is representative of one life cycle of Canadian-origin Yukon River salmon. At its foundation, it reflects the necessary actions identified by Yukon [F]irst [N]ations people who have experienced first-hand the effects of the decline of Yukon River chinook salmon for over two decades.[42]

The April 1st agreement was signed partway through the Committee's study. Bryce Bekar, President of the Yukon Fish and Game Association, called it a "good start."[43] While Chief Rhonda Pitka supported the April 1st agreement, she did not believe sufficient consultation had been undertaken with Alaska Natives before it was signed.[44]

Under the April 1st agreement, "subsistence fishing for Chinook salmon in the mainstem Yukon River and Canadian tributaries" will be closed over the seven-year period unless more than 71,000 Canadian-origin Chinook are projected to cross the international

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40 Steve Gotch, Senior Director, Operations, Pacific Region, DFO, *Evidence*, 18 April 2024.

41 Ibid.

See: *Agreement of April 1, 2024 regarding Canadian-origin Yukon River Chinook Salmon for 2024 through 2030*.

42 Steve Gotch, Senior Director, Operations, Pacific Region, DFO, *Evidence*, 18 April 2024.

43 Bryce Bekar, President, Yukon Fish and Game Association, *Evidence*, 18 April 2024.

44 Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 30 May 2024.

border.[45] Chief Pauline Frost did not believe that the seven-year moratorium in itself is going to make a "significant difference" and believed that there is "so much more that we have to do in terms of co-management, collaboration and really clearly coming up with a stock restoration plan."[46] The Committee received a brief from Brooke Woods that did not support a moratorium on subsistence and traditional harvest of salmon for Alaska Natives and Yukon First Nations.[47]

The *Umbrella Final Agreement*

Yukon First Nations, the Government of Canada and the Yukon Government signed the *Umbrella Final Agreement* (UFA) in 1993. The UFA "provides general agreement" on several issues including the joint management of fish and wildlife between the signatories.[48] Since 1993, eleven of the fourteen Yukon First Nations have

> negotiated and ratified their respective comprehensive land claim and self-government agreements in accordance with the UFA. These land claim agreements are known as the Final Agreements and they are land claim agreements within the meaning of section 35 of the *Constitution Act, 1982*.[49]

Section 35 of the *Constitution Act, 1982* "explicitly recognizes and affirms the existing Aboriginal and treaty rights of the Aboriginal peoples of Canada."[50]

CAUSES OF WILD PACIFIC SALMON DECLINE AND HOW TO ADDRESS THEM

The Committee heard about the dire state of wild Pacific salmon in the Yukon and British Columbia. Witnesses agreed that Yukon River salmon are facing multiple risks simultaneously. The causes of the declines are "complex and complicated. They occur at different scales across time and space and they all operate in the context of a changing climate."[51] Some threats, such as changes in the ocean and freshwater environments

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45 *Agreement of April 1, 2024 regarding Canadian-origin Yukon River Chinook Salmon for 2024 through 2030*.

46 Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

47 Brooke Woods, *Yukon River Salmon*, Brief submitted to FOPO, March 2024.

48 Council of Yukon First Nations, *Umbrella Final Agreement*.

49 Assembly of First Nations, *Population Sustainability of Yukon Salmon Stocks*, Brief submitted to FOPO, 27 May 2024.

50 Government of Canada, *INAN - Section 35 of the* Constitution Act 1982 *- Background - Jan 28, 2021*.

51 Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

because of climate change are more difficult to address directly with specific actions. Others, like the barriers to fish passage caused by the Whitehorse dam or bycatch and interception by commercial Alaskan fisheries in the Bering Sea and Gulf of Alaska, can immediately be addressed directly with actionable solutions. Witnesses urged action, with a particular focus on solutions that are within our control. They also believed that multiple causes for decline must be addressed simultaneously.

The Ocean Environment

Changes in Ocean Conditions due to Climate Change

Pacific salmon that spawn in both the Yukon and British Columbia mature in the Bering Sea and the Gulf of Alaska. According to Bathsheba Demuth, the Bering Sea is experiencing a "rapid degree of change" because of the warming climate.[52] Elizabeth MacDonald explained that warmer waters in the Bering Sea caused by climate change have "impacted the food web, and salmon are switching prey. This has decreased the energy available to them and decreased some important nutrients."[53]

Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences at the University of Alaska Fairbanks, shared that the "ocean seems like it is increasingly dangerous" for Pacific salmon, particularly for those who are genetically "programmed to spend a lot of time in the ocean" but are "not surviving." He added that: "We are losing those genes."[54]

Recommendation 2

That Fisheries and Oceans Canada recognize that a fundamental threat to the salmon population is climate change and that every measure adapted to these changes be taken without further delay to preserve the threatened species as quickly as possible.

Competition with Hatchery Salmon

The Committee heard about the impacts of sea ranching where billions of Pink and Chum salmon are being released into the North Pacific Ocean from "at least two

52 Bathsheba Demuth, Dean's Associate Professor of History and Environment and Society, Brown University, As an individual, *Evidence*, 15 February 2024.

53 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

54 Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

hundred hatcheries in Canada, the USA, Japan, Korea and Russia."[55] Hatchery salmon represent "over 40% of the biomass of salmon in the North Pacific."[56] Tim Gerberding explained that "[m]ost of the salmon you buy in the grocery store these days is coming from fish that returned to those hatcheries."[57]

These hatchery salmon compete with wild salmon for food which can lead to wild salmon having insufficient energy reserves to migrate to spawning grounds.[58] Peter Westley shared that the amount of prey available to be consumed by farmed and wild salmon in the ocean has changed through time and that current consumption is "at that limit and sometimes past it."[59] While other populations of wild Pacific salmon also compete with Pacific salmon bound for rivers in the Yukon or BC for food in the ocean, "we have more direct control on the hatchery" fish.[60] David Curtis called for the impacts of hatchery salmon on wild Pacific salmon "to be studied, understood better and controlled."[61]

Witnesses including Dennis Zimmerman, Tim Gerberding and David Curtis called for increased advocacy and diplomatic efforts from Canada to reduce the number of hatchery fish released into the Bering Sea.[62]

Recommendation 3

That the Minister of Fisheries, Oceans and the Canadian Coast Guard, Fisheries and Oceans Canada, the Minister of Foreign Affairs and Global Affairs Canada work with international counterparts that manage Pacific salmon fisheries to study how wild Pacific salmon are impacted by large-scale hatchery releases of Pink and Chum salmon into the

55 Tim Gerberding, Yukon Salmon Sub-Committee, *Standing Order 108(2) - Study Examining Population Sustainability of Pacific Salmon*, Brief submitted to FOPO, 12 February 2024.

56 Ibid.

57 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

58 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024; and Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

59 Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

60 Ibid.

61 David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

62 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024; Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024; and David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

North Pacific ecosystem by countries including the United States, Japan, Korea and Russia.

Pinniped Predation

The resurgence of marine mammal predators, including seals, could be making the ocean a more dangerous environment for Pacific salmon.[63] Peter Westley explained that the success of the *Marine Mammal Protection Act* in the United States has increased the number of nearshore marine mammals that used to be harvested by local people. He explained that there

> are way more seals than there likely have been in the ocean for thousands of years now because of the *Marine Mammal Protection Act* and because [I]ndigenous people have been displaced, erased off the landscape, and aren't harvesting marine mammals as much as they used to. That is something we have some control over.[64]

Recommendation 4

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and Fisheries and Oceans Canada, in cooperation with the governments of Alaska and the United States, assess impacts of pinniped predation on Pacific salmon stocks of Canadian origin and enable management measures necessary to support stock recoveries.

Alaskan Commercial Fisheries

Witnesses, such as Bathsheba Demuth, Brandy Mayes and Chief Rhonda Pitka, told the Committee that Alaskan commercial fisheries, particularly the trawl fishery, are affecting Pacific salmon by changing the Bering Sea ecosystem and food web, including by removing food sources for Pacific salmon such as herring.[65]

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63 Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024; and Urs Thomas, *Population Sustainability of Yukon Salmon Stocks*, Brief submitted to FOPO, 6 May 2024.

The Committee's report on this topic, *Ecosystem Impacts and Management of Pinniped Populations*, was tabled in the House of Commons in December 2023.

64 Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

65 Bathsheba Demuth, Dean's Associate Professor of History and Environment and Society, Brown University, As an individual, *Evidence*, 15 February 2024; Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024; and Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 15 February 2024.

The serious impacts of the Alaskan interception of wild Pacific salmon bound for BC rivers are described in an upcoming section. With regards to Yukon River salmon, the Committee heard that bycatch of wild Pacific salmon in Alaskan commercial fisheries is negatively impacting the number of salmon that would otherwise make their way into the Yukon River to spawn. The Committee specifically heard that bycatch of Pacific salmon, which would otherwise eventually return to the Yukon River, is happening in the pink salmon fishery in the Gulf of Alaska, and more specifically in area M in the North Pacific off the Alaska Peninsula, as well as in the pollock fishery.[66]

The Committee heard conflicting testimony about the importance of the impact of bycatch in Alaskan commercial fisheries on wild Pacific salmon. Witnesses including Brandy Mayes and Chief Rhonda Pitka listed bycatch of wild Pacific salmon as among the top causes for Yukon salmon decline.[67]

Tim Gerberding stated that, while "Alaska managers try to time Pollock openings to avoid Yukon River salmon," "subsistence fishers in Alaska believe that tens of thousands of immature Yukon River Chinook and Chum salmon continue to be caught in the Pollock fishery in Area M in the North Pacific off the Alaska Peninsula."[68] Bathsheba Demuth told the Committee that the bycatch of Pacific salmon in the pollock fishery could be underreported because of imperfect monitoring.[69] Dennis Zimmerman worried that, despite the presence of observers and other efforts to reduce bycatch, bycatch rates "have crept up again."[70]

Steve Gotch told the Committee that approximately 500 to 750 Chinook salmon are caught as bycatch in U.S marine fisheries every year, representing between 1% and 3% of total abundance.[71] Steve Gotch had "extremely high" confidence in the bycatch reporting from the "highly regulated monitoring program that's administered through state and federal agencies in Alaska" to identify bycatch in the Bering Sea and Aleutian Islands commercial fisheries. Under the monitoring program, independent observers

66 Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 15 February 2024.

67 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024; and Chief Rhonda Pitka, Beaver Village Council, *Evidence*, 15 February 2024.

68 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

69 Bathsheba Demuth, Dean's Associate Professor of History and Environment and Society, Brown University, As an individual, *Evidence*, 15 February 2024.

70 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024.

71 Steve Gotch, Senior Director, Operations, Pacific Region, DFO, *Evidence*, 18 April 2024.

present on all vessels fishing for groundfish, including pollock or cod, document the catch and actively participate in fishing activities. The "non-target species are enumerated and identified by species, and genetic tissue samples are taken for further analysis to determine the stock of origin in the case of Pacific salmon."[72] The Yukon River Panel's Joint Technical Committee publishes information on bycatch annually.[73] Peter Westley also had confidence that bycatch in pollock fisheries is having a minimal impact on Yukon salmon, but noted that reducing bycatch can directly address salmon decline.[74]

Recommendation 5

Given that conflicting testimony has been provided regarding the impact of ocean bycatch and how this is impacting numbers of salmon returning, it is critical that Fisheries and Oceans Canada either launch or support an independent review of this work in an effort to address disparities in witness testimony regarding the role of bycatch and the information received from the National Oceanic and Atmospheric Administration via Fisheries and Oceans Canada officials.

Recommendation 6

That the Government of Canada obtain information from the relevant bodies in the United States regarding the number of salmon caught as bycatch in the US pollock fishery, and report this information publicly in Canada through Fisheries and Oceans Canada.

Recommendation 7

The *Yukon River Salmon Agreement* should be extended to considerations of the ocean-side harvest, where testimony indicated that the 'abundance' offshore did not translate into salmon returns to the river.

In Freshwater in the Yukon

The various marine challenges facing Pacific salmon is causing them to, as described by the Honourable Nils Clarke, Minister of Environment for the Government of Yukon,

72 Ibid.

73 Bycatch reporting is presented in Appendix C of recent reports by the Joint Technical Committee. See: Yukon River Panel, *Yukon River Joint Technical Committee Reports*.

74 Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

begin "the longest migration in the world in a weakened state."[75] These weakened salmon may not have the energy and fat reserves necessary to travel thousands of kilometres upriver to their spawning grounds.[76] Stephanie Peacock emphasized that "Canadian Yukon chinook are the longest-migrating salmon in the world, and this increases their exposure to threats in fresh water."[77]

Habitat Loss and Changing River Conditions

Climate change has, as articulated by Stephanie Peacock, led to "unprecedented increases in river temperatures, which has correlated with reduced productivity of Yukon chinook over the past 28 years."[78] She believes that strategies "to mitigate rising river temperatures and their impacts on salmon, such as the protection of undeveloped watersheds and wetlands, need to be prioritized."[79] Other witnesses also noted that Pacific salmon are dying because of the physiological stress of rising water temperatures before making it to their spawning grounds.[80] Elizabeth MacDonald explained that more variable water levels caused by climate change, including frequent flooding and low water, "has affected migrating salmon and rearing juveniles during the freshwater stages."[81]

Bryce Bekar explained that obstacles to fish passage that change how the Yukon River flows, such as beaver dams, permafrost heaves, and washouts, could be negatively affecting the migrations of both adult fish up the river to spawning grounds and of juvenile fish to the ocean. He believed that the Yukon Fish and Game Association could be called upon to provide the human effort needed for the physical work of removing those barriers.[82]

75 Hon. Nils Clarke, Minister of Environment, Government of Yukon, *Evidence*, 13 June 2024.

76 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

77 Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

78 Ibid.

79 Ibid.

80 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024; and Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024.

81 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

82 Bryce Bekar, President, Yukon Fish and Game Association, *Evidence*, 18 April 2024.

Recommendation 8

That the Government of Canada act urgently, as a responsible partner to provincial and territorial governments, to protect and restore watersheds that are threatened by the climate crisis and environmental degradation caused by human activity.

Recommendation 9

The Government of Yukon and the Government of Canada should develop a water management strategy for the Yukon River to address low water levels and that impact on salmon spawning areas.

Fishing in the Yukon River

Starting in the 1840s, gillnets have been set on the Yukon River to catch Pacific salmon commercially.[83] The Committee heard that the large mesh sizes in these nets targeted the biggest, oldest fish for many years and that the biggest fish are often females.[84] The Committee also heard that the genetics of Chinook salmon has likely been affected due to big fish having been fished out of the population. David Curtis stated that there "can be no denying that the cumulative effects of previous harvest practices have had detrimental impacts, not only on the number, but also, and probably more importantly, on the quality of fish making it to the spawning grounds."[85]

Elizabeth MacDonald stated that, in Alaska, "some people need to choose whether to fish illegally or to starve. We need to support Alaskans so they have better options and in turn can support salmon recovery."[86]

Chief Pauline Frost told the Committee that, since there are no DFO fisheries officers to enforce compliance with management measures on the Porcupine River or the mainstem of the Yukon River, Yukon First Nations have been regulating and managing their members. As she explained,

83 David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

84 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024; Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024; and David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

85 David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

86 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

> [t]he decisions about the closure are left up to the [I]ndigenous communities to implement. We are left to implement the enforcement measures ourselves, which is not fair because the self-government agreement sets parameters. It is also Canada's obligation to participate equally in effective co-management.[87]

The Committee notes that illegal, unreported and unregulated fishing is likely a common issue in the ocean and across river systems. It should be factored into efforts to sustain and rebuild fish stocks.[88]

Recommendation 10

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and Fisheries and Oceans Canada prioritize establishing adequate monitoring and enforcement to combat illegal, unreported and unregulated fishing of Pacific salmon stocks of Canadian origin.

Mining Projects

Chief Pauline Frost stated that mining is a "huge pressure" on Pacific salmon in the Yukon River.[89] Chief Nicole Tom described the risks posed by "an old abandoned mine, the BYG mine" near Little Salmon Carmacks First Nation:

> [T]here's a threat that it could be leaking or bursting with freshet. There are so many horrible and deadly contaminants in there that would go into Dome Creek, the White River and the Yukon River, the very ecosystem that is already suffering in terms of the salmon. These issues are huge. It's ecocide. This is the death of an environment.[90]

87 Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

88 A report on this topic by the Committee was tabled on 3 October 2024. See: *Reducing the Harms Caused to Canadian Fish Stocks by Illegal, Unreported and Unregulated Fishing*.

89 Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

On 24 June 2024, after the Committee completed this study, sliding ore damaged the containment barrier of the heap leach facility at the Eagle Gold Mine operated by Victoria Gold Corporation, near Mayo. The failure released approximately 2,000,000 metric tonnes of material, including cyanide solution, into the environment; including into Haggart Creek. The Government of Yukon has launched an Independent Review Board to investigate causes and factors contributing to the heap-leach failure. See: Government of Yukon, *Victoria Gold Corporation's Eagle Mine heap leach failure*.

90 Chief Nicole Tom, Little Salmon Carmacks First Nation, *Evidence*, 15 February 2024.

According to Tim Gerberding, "the Government of Yukon simply isn't doing a really good job of managing salmon habitat."[91] He explained that the *Yukon Placer Mining Act*[92], which came into effect in 1906 and has "essentially been unchanged since that time," is not appropriately protecting salmon habitat:

> Under the Yukon free entry system, miners can stake claims virtually anywhere—not on [F]irst [N]ation land, but virtually anywhere else. There is a very strong connection between the right to work and the right to locate. In other words, once you stake a claim, you have very strong rights to proceed to mine that claim. I think that arrangement has disappeared in many parts of the world. I don't think that's appropriate in 2024, in the 21st century.[93]

He believed that DFO should apply more pressure on the Government of the Yukon to protect salmon habitat, stating that:

> [DFO] is responsible for managing salmon, but they have delegated that responsibility when it comes to so-called Yukon placer authorizations, which give placer miners the rights to literally relocate a salmon stream, mine it out and then put it back where it was, on the assumption that it will continue to be good salmon habitat. That's never really been proven.[94]

The Hon. Nils Clarke described the roles of the Yukon government and DFO to review placer mining projects and their impacts on salmon and salmon habitat as well as consult impacted Yukon First Nations to "mitigate impacts to salmon and other fisheries before projects enter the licensing stage by the Yukon Water Board."[95] During the licensing stage, the Yukon Water Board considers the Fish Habitat Management System, which "aims to protect fish and fish habitat while supporting a sustainable placer industry," as well as the

> terms and conditions related to diversions, settling, and suspended and settleable sediment discharge standards of each creek. If a placer mining project is allowed to

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91 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

92 Placer mining removes minerals found above bedrock. In the Yukon, gold mixed in gravel in ancient river bottoms is typically targeted. Extraction is achieved with water and gravity. The Klondike Gold Rush targeted placer gold. The "free entry system" of the *Placer Mining Act* allows anyone 18 years or older, regardless of Canadian or Yukon residency, to lay a claim to minerals anywhere in Yukon except for excluded areas including airports, cemeteries and certain municipal or settlement lands. If the claim is staked correctly, the rights to explore for and mine minerals located within the claim are automatically granted. Only subsequent work on a claim, such as water diversion or the construction of major mining infrastructure, requires consultation. Public consultations by the Government of Yukon on new minerals legislation were undertaken in 2023.

93 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

94 Ibid.

95 Hon. Nils Clarke, Minister of Environment, Government of Yukon, *Evidence*, 13 June 2024.

> proceed after assessment and regulatory reviews, monitoring programs are in place under the [F]ish [H]abitat [M]anagement [S]ystem to ensure that objectives of the fish habitat management system are achieved. … This management system is a requirement of [DFO] and is jointly enforced by the Yukon government's compliance, monitoring and inspections office.[96]

The Hon. Nils Clarke told the Committee that the Yukon government "remains committed to working with [DFO] on the ongoing administration" of the Fish Habitat Management System.[97]

Recommendation 11

That the Government of Yukon, in collaboration with Fisheries and Oceans Canada, increase efforts to establish that monitoring of placer miner effects on salmon spawning grounds by the Government of Yukon and Fisheries and Oceans Canada are fully compliant with the Fish Habitat Management System.

Recommendation 12

That the Government of Canada work urgently with the Government of Yukon to settle jurisdictional disagreements as they relate to the health and wellbeing of Yukon salmon populations, and where necessary strike new agreements to ensure that all gaps in regulatory oversight are closed.

Recommendation 13

The Government of Yukon should review its environmental assessments and regulations for placer mining operations, and the impact they have on water quality in the rivers.

Recommendation 14

That Fisheries and Oceans Canada, in partnership with Natural Resources Canada and, as necessary, Environment and Climate Change Canada, explore in collaboration with provincial and territorial bodies the impact that abandoned mines may be having on salmon populations in the watersheds within this biosphere, in particular, the risks from the leakage and runoff including from BYG in Yukon and the Tulsequah Chief Mine in BC, and that findings from this exercise be reported back to the Committee.

96 Ibid.

97 Ibid.

Recommendation 15

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and Fisheries and Oceans Canada work closely with the Government of Yukon and the governments of Alaska and the United States to ensure adequate protection of wild salmon habitats.

Hydroelectric dams

The Whitehorse Rapids generating station was completed in 1958. It flooded the traditional fishing locations of the Kwanlin Dün First Nation and "put the productive culturally important Michie Creek and M'Clintock River stocks in an uncertain situation."[98] The Whitehorse Rapids generating station is equipped with a fish ladder that is meant to help migrating Pacific salmon cross the generating station and reach spawning grounds upriver. According to a brochure prepared by Yukon Energy, the "366-metre fish ladder is one of the longest wooden fish ladders in the world."[99]

The Committee heard that the fish ladder is inefficient. Adult Pacific salmon, after migrating over 3,000 km upriver to spawn, may have difficulty crossing the 75-year-old fish ladder and be unable to reach their spawning grounds beyond it.[100] Juvenile Pacific salmon migrating downstream to the ocean may also be killed or injured while swimming through the dam's turbines or spillway. Brandy Mayes believed that there is a need for further study to determine the impacts of the dam on in-migrating and out-migrating salmon.[101]

Witnesses including Brandy Mayes, Chief Nicole Tom, and Stephanie Peacock listed the Whitehorse dam as among the top threats to Yukon River salmon that had an immediate actionable solution.[102] Witnesses including Brandy Mayes and Tim Gerberding described

98 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

99 Yukon Energy, *Whitehorse Generating Facilities*.

100 Bryce Bekar, President, Yukon Fish and Game Association, *Evidence*, 18 April 2024.

101 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

102 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024; Chief Nicole Tom, Little Salmon Carmacks First Nation, *Evidence*, 15 February 2024; Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

the need for appropriate fishways for in-migration and out-migration.[103] Bryce Bekar described the fish ladder as "designed to an old standard that could possibly use a facelift."[104]

While a new fishway is "not going to be immediate. It's going to take time, and it's going to take a lot of resources and money;" the Committee heard that the "opportunity is immediate."[105] The water use license of the Whitehorse hydro plant is set to expire in May 2025.[106] Tim Gerberding described improvements that could be made in the context of the relicensing process including turbine designs that are less damaging to salmon, graduated spillways that make it easier for salmon fry to out-migrate and improvements to the size and construction of the fish ladder.[107]

The Committee heard that hatchery salmon have been released near the Whitehorse hydro plant to compensate for the impact on spawning. For example, Bryce Bekar described a collaboration between the Yukon Fish and Game Association and Yukon Energy which releases 10,000 salmon fry into waterways near the Whitehorse dam to compensate for the impacts of the dam on salmon reproductive success. Tim Gerberding told the Committee that hatchery fish returning to the Whitehorse dam or beyond, identifiable because of their clipped adipose fins, "are markedly smaller and thinner than their wild cousins" and warned that while hatcheries

> seem like an easy answer sometimes, and they may very well play a role in preserving salmon, […] they will not play a role in preserving the genetics of the big fish. I think the only way we're going to preserve those genetics is to eliminate fishing and make it possible for those big fish to get back to the spawning grounds. … It's the wild fish that have the very precious and unique genetics. To preserve those genetics, we have to preserve the wild fish.[108]

Brandy Mayes highlighted that "Canada needs to fulfill its treaty obligation to the *Kwanlin Dün First Nation Final Agreement* under chapter 16.3.2.2, the Whitehorse

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103 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024; and Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

104 Bryce Bekar, President, Yukon Fish and Game Association, *Evidence*, 18 April 2024.

105 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

106 Yukon Energy, *Whitehorse Hydro Plant*.

107 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

108 Ibid.

fishway redevelopment project."[109] Section 16.3.2.2 of the *Kwanlin Dün First Nation Final Agreement* reads:

> Canada shall contribute toward participation of the Kwanlin [Dün] First Nation in the Whitehorse fishway redevelopment project planned by the Yukon Energy Corporation and its partners, including participation in:
>
> - joint planning and visioning with regard to the redevelopment and management of the Whitehorse fishway and hatchery;
> - planning related to fish stock rehabilitation and conservation issues;
> - redevelopment of the Whitehorse fishway and hatchery facilities.[110]

Recommendation 16

That the Government of Canada meaningfully and if needed, financially, contribute to the Kwanlin Dün First Nation as part of the Whitehorse Fishway Redevelopment project, honouring our Treaty Obligation 16.3.2.2 of the Kwanlin Dün Final Agreement.

Recommendation 17

That the Government of Canada work with stakeholders to modernize infrastructure along the Yukon River, such as improving fish ladders and other changes recommended under a stock restoration initiative.

Factors specific to BC Pacific Salmon

Greg Knox, Executive Director of the SkeenaWild Conservation Trust, told the Committee that B.C. salmon are "in crisis" and highlighted the presence of "high levels of illegal, unreported and unregulated fisheries" on the Fraser River where there is "literally no enforcement" by DFO fisheries officers, including "illegal fisheries that are impacting endangered stocks."[111]

Aaron Hill, Executive Director of the Watershed Watch Salmon Society, explained that many Canadian-origin salmon and steelhead from BC rivers "follow a clockwise arc around the Gulf of Alaska before they head south along the Alaska panhandle, where

109 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

110 Government of Canada, "Chapter 16: Fish and Wildlife," *The Kwanlin Dun First Nation Final Agreement*.

111 Greg Knox, Executive Director, SkeenaWild Conservation Trust, *Evidence*, 2 May 2024.

they are then intercepted in large numbers by Alaskan commercial fisheries."[112] Greg Knox added that "about 80% of the Alaskan sockeye catch is from B. C. rivers" and that "[u]p to about "30% of the Skeena sockeye run is taken in southeast Alaska each year."[113] There are growing conservation concerns for wild Skeena sockeye which "have declined by about 90% from their historical abundance."[114] According to Greg Knox, interception of Canadian-origin salmon has the "biggest impact" on many BC salmon populations.[115]

Greg Taylor, President of Fish First Consulting, appearing as an individual, explained that fisheries in Alaskan fishery district 104 are particularly problematic because the "area doesn't have any Alaskan pink or chum salmon runs or any other type of salmon runs out there. This is a pure interception fishery" and added that the "boats that operate out there have permits to fish anywhere else in southeast Alaska."[116] He proposed that the issue could be addressed by negotiating with Alaska to buy out the small number of boats that fish in the "offending area" or getting them to fish elsewhere.[117]

Aaron Hill pointed out that some Canadian salmon fisheries have been closed or "severely curtailed" and money has been spent on Pacific salmon recovery in Canada whereas "Alaskan fleets just across the border have not scaled back."[118]

Recommendation 18

That the Government of Canada undertake negotiations with the Government of the United States or the Government of Alaska to ensure that BC and Alaskan management measures regarding salmon are aligned, and are ecosystem-based.

Recommendation 19

That the Government of Canada undertake negotiations with the Government of the United States or the Government of Alaska to end intercept fishing in Alaskan fishery district 104.

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112 Aaron Hill, Executive Director, Watershed Watch Salmon Society, *Evidence*, 2 May 2024.

113 Greg Knox, Executive Director, SkeenaWild Conservation Trust, *Evidence*, 2 May 2024.

114 Ibid.

115 Ibid.

116 Greg Taylor, President, Fish First Consulting, As an individual, *Evidence*, 2 May 2024.

117 Ibid.

118 Aaron Hill, Executive Director, Watershed Watch Salmon Society, *Evidence*, 2 May 2024.

Recommendation 20

That the Government of Canada prioritize ending unsustainable intercept fishing as a reconciliation measure, in light of the impacts that interceptions have on First Nations on the West Coast of Canada.

TOOLS FOR PACIFIC SALMON PROTECTION AND RESTORATION

In the context of the seven-year suspension of directed Chinook fishing imposed through the April 1st agreement, Chief Pauline Frost spoke of the need for a "broad discussion around the impacts and effects that we are seeing from climate, predation, illnesses, warming waters, warming trends—everything that's affecting the salmon."[119] Stephanie Peacock believed that the "complexity of the lifecycle and management systems for Yukon chinook necessitates a multipronged approach to recovery. Management discussions must shift from border passage to preserving the biodiversity within Canadian-origin Yukon chinook."[120]

Collaboration and Funding

Witnesses expressed a clear willingness to work together and adopt new approaches to save wild Pacific salmon. Brandy Mayes told the Committee that to "rebuild a population that has been depleted to the point of near extinction is going to take every resource we have. It's going to take every effort we have. This includes all levels of government on both sides of the border."[121] Wes Shoemaker, Executive Head of the Pacific Salmon Strategy Initiative at DFO, said that "[n]o one thing is going to help us turn the corner with respect to the increased health and abundance of Pacific salmon; it's going to take a lot of different actions."[122] Tim Gerberding believes that

> this is going to take a multigovernment, collaborative effort. It's not going to be easy. I think it will mean we'll have to change regulations. It's going to cost money, and it's going to mean sacrifice on the part of industry. However, unless we're prepared to make

119 Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

120 Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

121 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

122 Wes Shoemaker, Executive Head, Pacific Salmon Strategy Initiative, DFO, *Evidence*, 18 April 2024.

> some sacrifices and to take some bold and decisive action, we're going to lose our salmon.[123]

The Hon. Nils Clarke highlighted how the Yukon Government has been collaborating with involved parties:

> We are working with Yukon [F]irst [N]ations to address some of the concerns, including improving fish passage across Yukon hydroelectric projects; building relationships to discuss the feasibility of conservation hatcheries …. ; protecting areas of cultural importance in our [F]ish [H]abitat [M]anagement [P]rogram; and working with all our partners to develop a Yukon River salmon rebuilding plan.[124]

Elizabeth MacDonald underscored the importance of "secure and long term" funding to be able to "focus on rebuilding salmon populations and not on administrating funding agreements."[125] The Hon. Nils Clark told the Committee that much of the federal funding earmarked for wild Pacific salmon recovery has gone to BC instead of the Yukon. He advocated that the federal government "divert some of the funds that have been provided specifically for B. C. salmon restoration and divert them to the Yukon River restoration efforts" and added that "those discussions continue."[126]

Recommendation 21

That the Government of Canada sufficiently increase the funding and resources available to invest in the concrete measures as determined by experts and stakeholders to be necessary to reverse the decline in Yukon River Salmon.

Recommendation 22

That efforts by all parties to address the declining salmon populations consider habitat restoration, combating and mitigating the effects of climate change, overcoming or mitigating the effects of man-made obstructions in the routes taken by the salmon and other measures deemed impactful in this project.

Recommendation 23

That the Government of Canada recognize the impact that climate change is having on ocean and river health, including its impacts on the Yukon River Salmon and other

123 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

124 Hon. Nils Clarke, Minister of Environment, Government of Yukon, *Evidence*, 13 June 2024.

125 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

126 Hon. Nils Clarke, Minister of Environment, Government of Yukon, *Evidence*, 13 June 2024.

species, and that the Government of Canada work collaboratively with other levels of government and across jurisdictions to support comprehensive action to reverse, combat and mitigate the impacts of climate change as part of its response to restoring the sustainability of Yukon River Salmon.

Data Collection, Monitoring and Scientific Activities

While recognizing the importance of studying the causes of Pacific salmon decline, witnesses hoped future studies would be focussed on finding actionable solutions. Stephanie Peacock highlighted that although "research into the drivers of these declines must continue, we cannot wait for evidence to accumulate before taking actions to prevent the extinction of Yukon chinook."[127] Peter Westley highlighted the importance of prioritizing "science that really is likely to make a difference" and "helps inform trade-offs and decision-making." He added that "science that is really good for helping [to] understand salmon ecology and biology, while fascinating and important, may not provide the levers for us to pull to make a difference."[128]

According to Stephanie Peacock, "very little information" is available on how most salmon conservation units are doing. Monitoring and data availability need to be improved "at the scale of conservation units to be able to identify when and where actions are required to avoid local extinctions and loss of biodiversity."[129] She added that DFO has not prioritized "centralizing and making data [publicly] available" and that, even when data is publicly available, it is focused on border passage and omits other elements like recent spawning information.[130]

Recommendation 24

That the Government of Canada provide sufficient attention and resources to monitoring individual conservation units of Yukon salmon, as more fine-grained monitoring of returns is necessary to prevent local level extinction and biodiversity loss.

In a brief to the Committee, Urs Thomas noted that a lack of stock assessments can be a "big hurdle to overcome" when developing "timely and sustainable decisions" to

127 Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

128 Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences, University of Alaska Fairbanks, *Evidence*, 30 May 2024.

129 Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

130 Ibid.

manage the salmon resources. The lack of data "might put stocks at risk and prevents solid fishing plans for all harvest sectors ending up in social and economic hardship."[131]

Stephanie Peacock shared that Yukon First Nations "have taken amazing leadership on monitoring salmon within their territories."[132]

Recommendation 25

That Fisheries and Oceans Canada make management decisions as close to the ground as possible by consulting communities and relevant stakeholders directly impacted by the species' decline to ensure the best data is obtained to improve territorial management, so that the right decision is made in the right place and overall consistency is encouraged.

Recommendation 26

That the Government of Canada increase its funding commitment through Fisheries and Oceans Canada to allow more resources and focus to be directed towards monitoring and data collection of Yukon River and Northern BC salmon.

Incorporating Traditional Knowledge

The Committee heard about the importance of including traditional knowledge in management and rebuilding strategies. Brandy Mayes hoped for "equal inclusion of both traditional knowledge and science in all decision-making."[133] David Curtis hoped for a "shift in management policies towards ones that integrate both traditional and scientific practices to increase the health of the salmon population and, in turn, all the people who live along the Yukon River."[134] The April 1st agreement calls for "the incorporation of traditional knowledge in decision-making."[135]

Chief Nicole Tom shared that by

> bringing back traditional knowledge, we are striving to redress this imbalance, as we have done in the past, but we are no longer alone in this responsibility, and we desire

131 Urs Thomas, *Population Sustainability of Yukon Salmon Stocks*, Brief submitted to FOPO, 29 April 2024.

132 Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

133 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

134 David Curtis, Documentarian and Fisherman, As an individual, *Evidence*, 30 May 2024.

135 Steve Gotch, Senior Director, Operations, Pacific Region, DFO, *Evidence*, 18 April 2024.

> that other cultures respect our concerns and work with us to achieve a more harmonious relationship with the salmon and all life.[136]

Bathsheba Demuth noted that Yukon First Nations and Alaskan Natives "have tens of thousands of years of experience in living well with salmon, and, in fact, this is the normal historical experience for salmon and people, so it is a thing that can be done."[137]

The Committee heard that sufficient funding to enable each Yukon First Nations government to have a dedicated salmon person on staff is important "so they can focus on restoration work and on keeping salmon culture alive until the salmon recover."[138]

Recommendation 27

Given that there are many examples of First Nations taking the lead in protecting and conserving local salmon stocks for generations to come, that Fisheries and Oceans Canada work alongside First Nations to implement traditional knowledge and practices in Yukon salmon management and rebuilding strategies.

Recommendation 28

That the Government of Canada enhance investments in First Nations community-based stewardship efforts including conservation and monitoring work, with an emphasis on sustainable and predictable multi-year programming.

Recommendation 29

That the Government of Canada work collaboratively with the governments of the United States, the State of Alaska, Yukon and the governments of relevant First Nations and American Indian communities, along with relevant stakeholders, to balance science and traditional knowledge in developing and implementing a plan to reverse the decline in Yukon River Salmon (Chinook) populations (and launch stock restoration initiatives).

136 Chief Nicole Tom, Little Salmon Carmacks First Nation, *Evidence*, 15 February 2024.

137 Bathsheba Demuth, Dean's Associate Professor of History and Environment and Society, Brown University, As an individual, *Evidence*, 15 February 2024.

138 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

Recommendation 30

That the Government of Canada work collaboratively with Yukon First Nations to honour and continue meaningful efforts towards implementing Final Agreements, in particular those components related to the conservation and protection of Yukon River Salmon.

Conservation Hatcheries

Tim Gerberding described conservation hatcheries to the Committee as follows:

> A conservation hatchery would seek to take brood stock, incubate them in a good place and then plant them into [a creek with low salmon returns that previously had healthy runs] for a cycle, which we will call seven years, in hopes of restarting that run. … Conservation fisheries can be, I think, very effective in restoring the runs over a short period, usually one cycle, for a specific stream.[139]

He cautioned that the gene expression of fish coming back from the hatchery can be affected and that if "those fish start to breed with the wild fish, over time and over several cycles, you can actually compromise the genetics of the wild fish."[140]

Brandy Mayes called for the Government of Canada to

> continue to provide capacity, money and resources to the Yukon River salmon rebuilding strategy and continue to support Kwanlin Dün on the feasibility and development of a salmon stewardship centre. That will support all Yukon [F]irst [N]ations in their rebuilding and restoration efforts as a gathering and teaching place, a restoration and research hub, and a centre for chinook restoration.[141]

She added that the stewardship centre is interested in potentially developing a conservation hatchery that would take some of the "brood stock that's left to make sure we can restore some of these creeks."[142]

While acknowledging that not all Yukon First Nations are supportive of hatcheries, the Hon. Nils Clarke confirmed that the Yukon "Department of Environment supports the idea of a Yukon-based conservation hatchery, and we are continuing discussions with [DFO]

139 Tim Gerberding, Chair, Yukon Salmon Sub-Committee, *Evidence*, 30 April 2024.

140 Ibid.

141 Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources, Kwanlin Dün First Nation, *Evidence*, 15 February 2024.

142 Ibid.

and Yukon [F]irst [N]ations to provide support when called upon."[143] He also described meetings between Department of Environment staff and the Kwanlin Dün First Nation to discuss how the "department can support the development of the new Kwanlin [Dün] First Nation salmon stewardship centre, which will include a Kwanlin [Dün] First Nation-led conservation hatchery feasibility study."[144]

Recommendation 31

That the Government of Yukon, in collaboration with Yukon First Nations and Fisheries and Oceans Canada, develop the Kwanlin Dün First Nations Salmon Stewardship Centre, which will include a feasibility study for a Yukon-based conservation hatchery for Yukon Salmon.

Updating the *Pacific Salmon Treaty* and the *Yukon River Salmon Agreement*

Chief Pauline Frost described the *Pacific Salmon Treaty* as a "very restrictive" agreement focused solely on border passage that does not allow "discussion or deliberations on effective co-management."[145] She was hopeful that the April 1st agreement would allow Canada "to fully participate in opening up the *Yukon River Salmon Agreement*," to "participate internationally regarding the pressures [on Pacific salmon in] the Bering Sea," and "to have discussions around how we, collectively, are responsible as three parties of government—self-governing [F]irst [N]ations, the Yukon government and Canada—to collaborate in Canada on a stock restoration initiative."[146]

Stephanie Peacock suggested that, in the face of "unprecedented declines," the *Yukon River Salmon Agreement* should be re-examined to focus on "biodiversity conservation and rebuilding" rather than the current primary focus on management, "even as allowable catches have declined to zero."[147] Dennis Zimmerman proposed that the "quality" of the Pacific salmon—including age, size and fecundity of the fish reaching spawning grounds—

143 Hon. Nils Clarke, Minister of Environment, Government of Yukon, *Evidence*, 13 June 2024.

144 Ibid.

145 Chief Pauline Frost, Vuntut Gwitchin First Nation, *Evidence*, 30 April 2024.

146 Ibid.

147 Stephanie Peacock, Senior Analyst, Pacific Salmon Foundation, *Evidence*, 15 February 2024.

should be considered rather than solely focusing on the number of fish crossing the border.[148]

Recommendation 32

That the governments of Canada and the United States, in collaboration with the governments of Yukon and Alaska, shift from the current *Yukon River Salmon Agreement* focussed on border passage towards developing a comprehensive binational agreement with a goal of restoring and rebuilding Yukon River Salmon and its supporting ecosystem.

Bathsheba Demuth highlighted that the Yukon River Panel is

> designed in such a way that it regulates salmon only within the Yukon River itself, rather than having jurisdiction and a remit over the ocean where they spend so much of their lives. The Yukon River Panel can do everything it possibly can—and it is doing that in many cases—within the river system itself, but where the Yukon River salmon spend so much of their lives is in the oceans. Therefore, they are subject to other kinds of regulation or a lack of regulation, as the case may be, in that space.[149]

Bathsheba Demuth told the Committee that "the *Yukon River Salmon Agreement* lays out 20th-century tools for what are becoming very 21st-century problems—climate change and ecosystem change due to intensive harvesting."[150]

Recommendation 33

That the Government of Canada amplify cross-border work with the governments of Alaska and the United States on conservation initiatives and fisheries control measures that will help to ensure a future for wild Pacific salmon and the future implementation of a fair and sustainable *Yukon River Salmon Agreement*.

Recommendation 34

That the Government of Canada conduct negotiations to ensure that exemptions for First Nations to the 7-year Yukon Chinook Moratorium, if considered, are applied equitably on both sides of the border, with adequate consultation in all cases.

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148 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024.

149 Bathsheba Demuth, Dean's Associate Professor of History and Environment and Society, Brown University, As an individual, *Evidence*, 15 February 2024.

150 Ibid.

Recommendation 35

That the Minister of Fisheries, Oceans and the Canadian Coast Guard and the Government of Canada begin the work to renegotiate the *Yukon River Salmon Agreement* with the United States to better reflect current realities including consideration to refocusing the metrics that are currently based solely on escapement size to include other metrics including the size, sex and age of the fish, as well as recognizing and incorporating traditional knowledge into assessment and decision-making.

Recommendation 36

That the Minister of Fisheries, Oceans and the Canadian Coast Guard, Fisheries and Oceans Canada and other ministers and departments increase international diplomatic actions to ensure treaties and agreements for the management of Pacific salmon:

- **establish fisheries management and regulations supporting sustainability and conservation of stocks of Canadian origin, especially stocks of concern;**

- **ensure Indigenous communities in Canada and Canadian harvesters have priority of access to salmon stocks of Canadian origin.**

Education and Outreach

Elizabeth MacDonald believes that "people losing connection with salmon is also a major threat. People aren't connected. They won't go out and fight for protections for habitat or give up other things to keep the habitat."[151] Dennis Zimmerman believes that "if people, [F]irst [N]ations, recreational fishers and the general public are not interacting with salmon in some way, they are not likely to care nor wish to support it."[152] He told the Committee that this would lead to a lack of advocacy and a "shifting baseline:" a shift over time in the accepted norms and expectations regarding what a healthy ecosystem baseline looks like.[153] Bryce Bekar told the Committee that our "youth will not care about the salmon if they do not know of their importance to the ecosystem" and that the Yukon Fish and Game Association "would like to work with all organizations to learn more about the

151 Elizabeth MacDonald, Manager of Fisheries, Council of Yukon First Nations, *Evidence*, 15 February 2024.

152 Dennis Zimmermann, Fish and Wildlife Consultant and Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants, *Evidence*, 15 February 2024.

153 Ibid.

current situation and to help inform and motivate Yukoners on the importance of salmon in the ecosystem."[154]

Recommendation 37

That any part of a response to preserve and protect Yukon River Salmon and Northern BC Salmon also provide support for relevant education about the importance of salmon for residents and visitors, including children and youth.

CONCLUSION

Pacific salmon in the Yukon face many threats. While the focus of this study was on management of the fishing effort and the state of the habitat along the river systems, reflections were also made on the interception of salmon runs by the Alaskan commercial fishery. It was stated that ocean-side fish stocks bound for the Yukon River were "in abundance," suggesting that there should be further examination of the impact of all fisheries on the prospects of restoring salmon populations. Efforts to conserve wild Pacific salmon must address both the removal of salmon through fishing efforts and the environmental conditions of the freshwater and ocean environments that salmon inhabit. The Committee heard that some causes for the decline, such as the barrier to migration posed by the Whitehorse dam and interception and bycatch in Alaskan at-sea commercial fisheries, can and should be addressed immediately. Other causes, including the environmental changes caused by climate change, require long-term, larger scale solutions.

The Committee urges the Government of Canada to take all necessary steps to protect the Pacific salmon so critical to both the Yukon ecosystem and Yukon First Nations culture. The Committee is encouraged by the earnest desire of witnesses to work together to do what is needed to conserve and rebuild Pacific salmon stocks in the Yukon. It hopes the recommendations presented in this report will contribute to this important work.

154 Bryce Bekar, President, Yukon Fish and Game Association, *Evidence*, 18 April 2024.

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
As individuals	2024/02/15	99
Dennis Zimmermann, Fish and Wildlife Consultant/Pacific Salmon Treaty Panel Member, Big Fish Little Fish Consultants		
Bathsheba Demuth, Dean's Associate Professor of History and Environment and Society, Brown University		
Council of Yukon First Nations	2024/02/15	99
Elizabeth MacDonald, Manager of Fisheries		
Kwanlin Dün First Nation	2024/02/15	99
Brandy Mayes, Manager, Operations & Fish and Wildlife, Heritage, Lands and Resources		
Little Salmon Carmacks First Nation	2024/02/15	99
Chief Nicole Tom		
Pacific Salmon Foundation	2024/02/15	99
Stephanie Peacock, Senior Analyst		
Department of Fisheries and Oceans	2024/04/18	106
Steve Gotch, Senior Director, Operations, Pacific Region		
Wes Shoemaker, Executive Head, Pacific Salmon Strategy Initiative		
Yukon Fish and Game Association	2024/04/18	106
Bryce Bekar, President		
Fédération québécoise pour le saumon atlantique	2024/04/30	107
Myriam Bergeron, Director General, Biologist		

Organizations and Individuals	Date	Meeting
Vuntut Gwitchin First Nation	2024/04/30	107
Chief Pauline Frost		
Yukon Salmon Sub-Committee	2024/04/30	107
Tim Gerberding, Chair		
As an individual	2024/05/02	108
Greg Taylor, President, Fish First Consulting		
SkeenaWild Conservation Trust	2024/05/02	108
Greg Knox, Executive Director		
Watershed Watch Salmon Society	2024/05/02	108
Aaron Hill, Executive Director		
As an individual	2024/05/30	112
David Curtis, Documentarian and Fisherman		
Beaver Village Council	2024/05/30	112
Chief Rhonda Pitka		
University of Alaska Fairbanks	2024/05/30	112
Peter Westley, Wakefield Chair of Fisheries and Ocean Sciences		
Government of Yukon	2024/06/13	114
Hon. Nils Clarke, Minister of Environment		

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.

Assembly of First Nations

Council of Yukon First Nations

Little Salmon Carmacks First Nation

Thomas, Urs

Woods, Brooke

Yukon Salmon Sub-Committee

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. 99, 106 to 109, 112, 114, 117 and 121) is tabled.

Respectfully submitted,

Ken McDonald
Chair