

Wild Salmon Policy



Fisheries and Oceans Canada | Pacific Region
2018–2022 IMPLEMENTATION PLAN

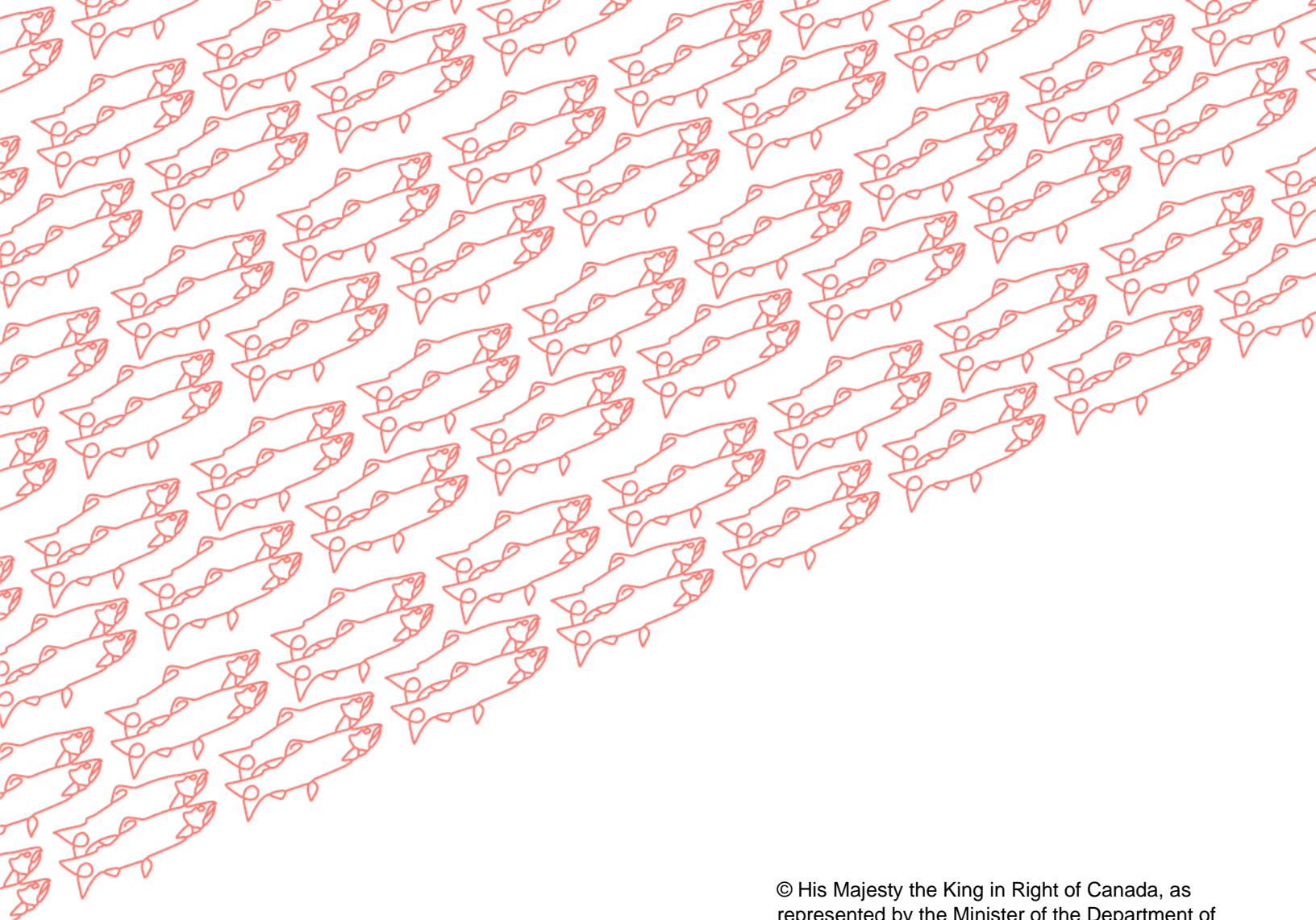
FIVE-YEAR REVIEW



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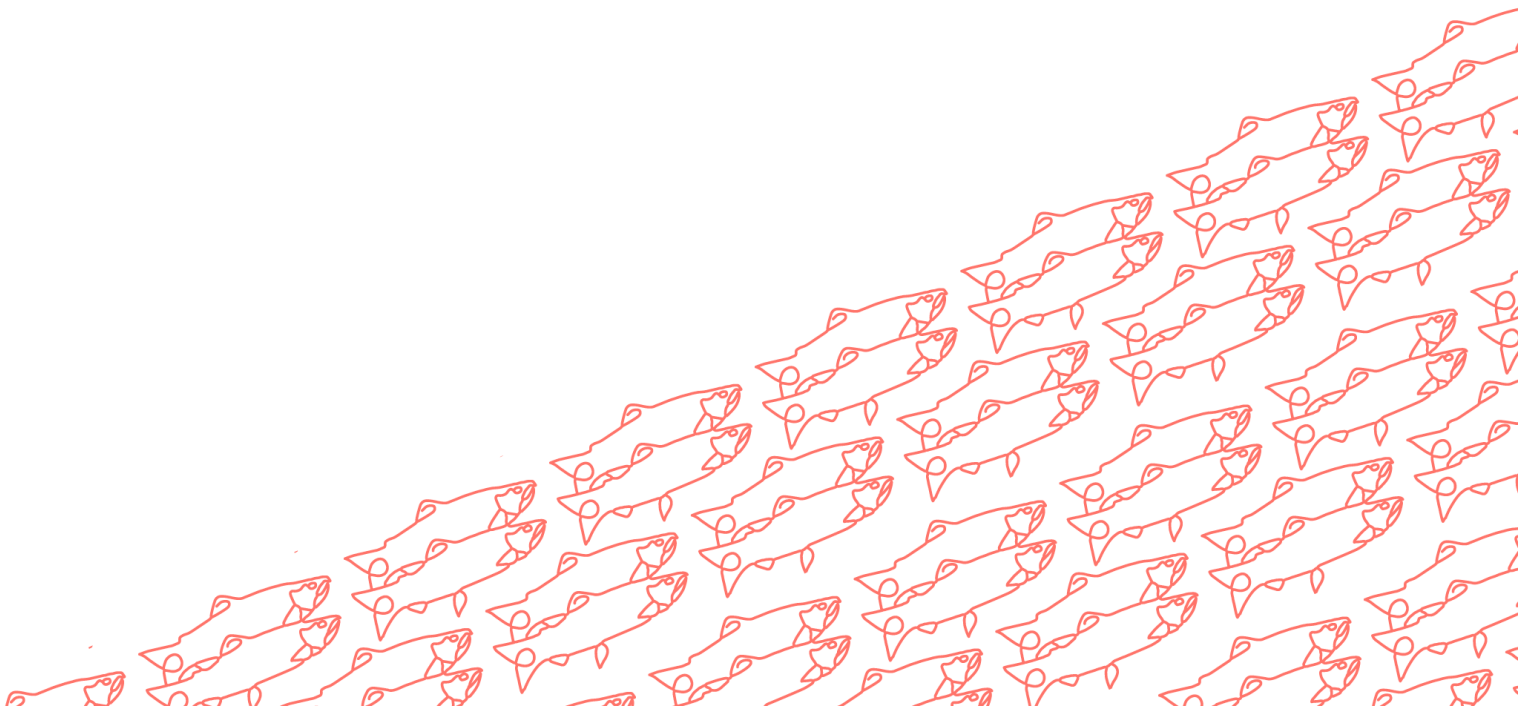
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Summer, 2023

Table of Contents

Executive Summary	3
Introduction.....	5
WSP Implementation Plan Results.....	9
WSP Implementation Plan Achievements	10
Are we closer to the WSP’s goals and objectives?.....	24
Other Regional Initiatives Supporting Salmon Rebuilding	33
Conclusion.....	36
Annex A: Wild Salmon Policy Implementation Plan Resources and Acronyms	37
Annex B: WSP Implementation Plan Activity Status	40





Executive Summary

The Wild Salmon Policy (WSP) was released in 2005 and marked a major turning point in the management of Pacific salmon by Fisheries and Oceans Canada (DFO). Today, the WSP continues to serve as DFO's key policy guidance for the conservation and restoration of wild Pacific salmon. The goal of the WSP is to “restore and maintain healthy and diverse salmon populations and their habitats for the benefit and enjoyment of the people of Canada in perpetuity.” This goal remains as important as ever, given continued declines and the myriad of challenges facing Pacific salmon populations.

The Wild Salmon Policy Implementation Plan: 2018-2022 (the Plan) was released in 2018 to provide additional guidance for DFO and partners to focus efforts and track progress against the goal, objectives, and activities outlined in the policy. The Plan outlined a series of activities focused on standardizing assessment methods, and supporting partnerships and communities in collectively working to maintain and rebuild Pacific salmon populations and their habitats. The Department committed to undertaking 48 activities between 2018 and 2022, with six further activities added to the Plan in 2021 related to the renewed *Fisheries Act*. The Plan also emphasized DFO's commitment to reviewing performance, through annual reporting and a five-year review of implementation. This review summarizes progress on all 54 activities, including whether the activities were implemented as planned, highlights key results, and reflects on whether the Plan brought us closer to achieving the WSP's goal and objectives. The review also includes an annex with annual reporting for the 2021-22 fiscal year.

Results from the five-year review are organized under the three key themes identified in the Plan, as well as the WSP's six strategies:

Theme 1: Assessment

Strategy 1: Standardized Monitoring of Wild Salmon Status

Strategy 2: Assessment of Habitat Status

Strategy 3: Inclusion of Ecosystem Values and Monitoring

Theme 2: Maintaining and Rebuilding Stocks

Strategy 4: Integrated Strategic Planning

Strategy 5: Annual Program Delivery

Theme 3: Accountability

Strategy 6: Performance review



Of the 54 activities, 28 had target completion dates on or before March 31, 2022. 20 of these were completed on time, while work on the remaining eight activities is ongoing. 26 activities under the Plan were identified as ongoing, with almost all of those activities will continue past 2022.

While completion of some activities has been delayed, work has advanced under all of the themes and strategies. Under the **Assessment** theme, significant progress was made under WSP Strategy 1, specifically on standardizing data collection, monitoring, and assessment methodologies, including completing the current list of wild salmon Conservation Units (CU), and formalizing a framework for reviewing and approving any revisions to CU descriptions. DFO will continue to build upon this work to identify groups of CUs to prioritize for biological stock assessment. While several activities were completed under WSP Strategies 2 and 3, further work is required to characterize key habitats and status indicators for CUs, which can then inform risk assessments. The Risk Assessment Methodology for Salmon (RAMS) is nearing publication, which will allow for identification of management interventions to conserve, restore, or enhance salmon CUs.

Under the **Maintaining and Rebuilding Stocks** theme, several activities were advanced related to WSP Strategy 4, including incorporating CU status considerations, enhancement production planning, and habitat and ecosystem information into Integrated Fisheries Management Plans (IFMPs), and developing a methodology to establish Limit Reference Points for salmon stocks. Moving forward,



Photo: Eiko Jones · Sockeye Salmon (*Oncorhynchus nerka*)



a strategic approach will be required to expand information in the IFMPs and scope the material that should be included to support management processes. DFO also investigated new research tools to diagnose and study disease and other conditions affecting wild salmon, and completed assessments to support science advice regarding risks to wild salmon from pathogens originating from salmon aquaculture operations. Through WSP Strategy 5, progress was made in terms of ensuring WSP considerations are incorporated into planning and decision making for salmon enhancement.

Finally, under the **Accountability** theme, DFO fulfilled annual reporting requirements (WSP Strategy 6). Previous Annual Reports can be found [here](#).

Despite significant progress under the Plan, many salmon populations continue to decline, with climate change and other environmental pressures being key factors. Moving forward, DFO will continue to improve our understanding the role of climate change in salmon declines and inform the development of climate change-resilient rebuilding approaches. As noted in the 2019 State of the Salmon Report “[currently], salmon recovery, habitat restoration and fisheries management actions operate under the assumption that future salmon production will function similarly to how it has in the past. However, under rapidly changing climate conditions this assumption is no longer valid. Changing climate means that conditions are increasingly falling outside the bounds of historical observations. This can alter the effectiveness of activities currently relied upon to manage salmon and their ecosystems, and ultimately puts salmon populations at risk” (Grant et al. 2019).

Given the urgent situation facing Pacific salmon, DFO launched the Pacific Salmon Strategy Initiative (PSSI), a transformational investment of over \$740 million to conserve and restore Pacific salmon stocks. The PSSI will guide a strategic and coordinated long term response to Pacific salmon declines. Rooted in collaborative action, the PSSI aims to stabilize and restore Pacific salmon and salmon habitat for the people, communities and ecosystems that depend upon their sustainability. Actions under the PSSI align with and support the WSP goal and objectives, to a common outcome of wild Pacific salmon populations being rebuilt and maintained for the long-term. The key links between the WSP and PSSI are outlined in this review (pages 28-33).

Introduction

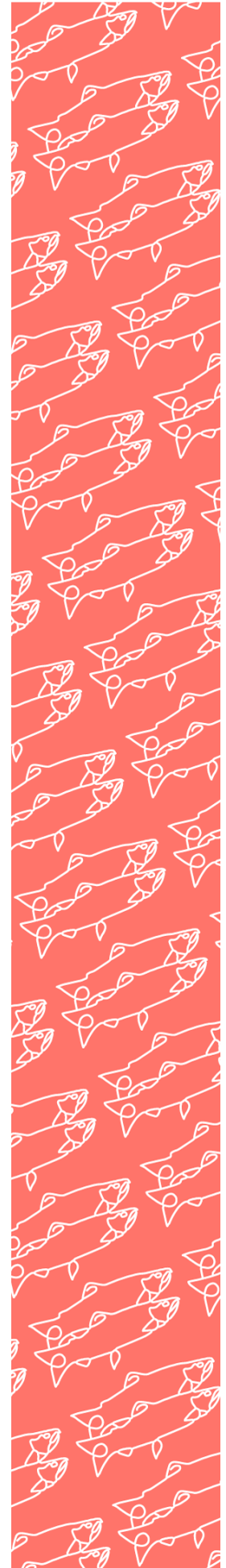
Wild Pacific salmon are an iconic part of the life and culture of Canada’s West Coast. They hold tremendous value for natural ecosystems, cultural and spiritual practices, recreational enjoyment, and jobs along the coast and inland waters of the Pacific Region. Pacific salmon are a keystone species in marine, freshwater, and terrestrial ecosystems. Many species of fauna and flora—from killer whales to black bears to Douglas Fir trees—depend on migrating Pacific salmon for their survival and life processes. Salmon are also inextricably linked to Indigenous communities in British Columbia (BC) and Yukon, not only as a traditional food source, but also as a vital component of spiritual, cultural, social, and economic well-being.

Conservation of wild Pacific salmon stocks is a key priority for DFO. Many Pacific salmon populations are suffering losses at every life stage due to a combination of factors including climate change and warming waters; habitat degradation, changes in land and water use, and pollutants; acute one-time events (toxic spills and landslides); and illegal, unreported, and unregulated international fishing pressures. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has assessed 62 different Pacific salmon Designatable Units (DUs) since 2016 and designated 43 of them as at risk. Those 43 DUs are under consideration for listing under the *Species at Risk Act* (SARA).

The WSP was released in 2005, following several years of extensive consultation and engagement with First Nations, stakeholders, other levels of government, and



Photo: Eiko Jones · Chum Salmon (*Oncorhynchus keta*)



the public. The policy marked a major turning point in the management of Pacific salmon by articulating a conservation ethic to preserve both genetic diversity and abundance. The goal of the WSP is to: “...restore and maintain healthy and diverse salmon populations and their habitats for the benefit and enjoyment of the people of Canada in perpetuity.” To meet this goal, the WSP set out three objectives and identified six strategies, including Strategy 6 which committed DFO to ongoing review of the implementation and success of the Policy. The [Wild Salmon Policy Implementation Plan: 2018-2022](#) was released in October 2018 and outlined 48 specific activities DFO would undertake over a five-year period to advance the WSP goal and objectives. It also grouped the strategies into three interrelated themes: assessment; maintaining and rebuilding stocks; and accountability. In 2021, DFO published an [Addendum to the Plan](#), which introduced six additional activities derived from new programming under the renewed *Fisheries Act*.

The 2018-2022 period brought several significant and unforeseen challenges. For example, the COVID-19 pandemic delayed key field work and consultation activities. Extreme weather and related events, including extreme heat, fires, and floods, affected both communities and salmon habitats. These events underscore that future efforts to conserve and rebuild salmon stocks will need to be flexible and responsive in the face of changing environmental conditions.

The Department’s approach to salmon conservation is also informed by the recent modernization of the *Fisheries Act*. The renewed Act introduced new tools which will support continued WSP implementation: (1) the introduction of Fish Stocks Provisions for prescribed major fish stocks; and (2) the transformation of the Fisheries Protection Program into the Fish and Fish Habitat Protection Program (FFHPP) with an enhanced mandate and resourcing.

The principles of the Wild Salmon Policy—focusing on conservation, working with First Nations, making decisions that ensure sustainable use, and making decisions in an open and transparent process—continue to guide the Department’s work in this area. Collaboration among all levels of government, First Nations, communities, industries, and non-governmental organizations is required to rebuild healthy Pacific salmon populations. Habitat management, integrated resource management, land protection, and local planning and zoning all require active participation and collaboration among multiple jurisdictions. Given this complex landscape, the Department works with different partners depending on the implicated authorities and the spatial scale of the activity being undertaken. Importantly, DFO’s work on Pacific salmon and habitat is also guided by the Government of Canada’s commitment to a renewed, nation-to-nation relationship with Indigenous peoples, and by other key policies including the Precautionary Approach to Fishery Decision-Making. While the Plan has been focused on activities that the Department is taking or leading, DFO recognizes that conserving and rebuilding salmon cannot and should not be done by government



alone. Partners across BC and Yukon are actively contributing toward the Wild Salmon Policy goal of maintaining and restoring wild salmon populations.

While the implementation period for this particular plan has ended, the Government of Canada continues to invest heavily in the conservation and long-term rebuilding of Pacific salmon. Budget 2021: A Recovery Plan for Jobs, Growth, and Resilience provided a **transformational investment** of over \$740 million starting in 2021-22 for DFO to stabilize and conserve wild Pacific salmon populations. The Pacific Salmon Strategy Initiative, launched on June 8, 2021, aims to stem the historic decline of many Pacific salmon populations and to conserve and rebuild stocks where possible by implementing a series of immediate and long-term solutions that focus on habitat, hatchery, and harvest measures, along with greater integration and collaboration. A PSSI strategic framework has been developed to guide the implementation of new and existing actions, and to advance federal efforts towards the new proposed federal Pacific salmon vision: “working together to conserve and restore Pacific salmon stocks and their ecosystems, for those who depend on them.” The PSSI represents Canada’s largest ever investment in salmon and a transformational shift in how Pacific salmon are managed on Canada’s west coast. Aligned with the broad goals and objectives of the WSP, DFO will be advancing PSSI implementation in collaboration with First Nations, as well as BC and Yukon governments, harvesters, environmental groups, academia, and the public.



Photo: Eiko Jones · Coho Salmon (*Oncorhynchus kisutch*)



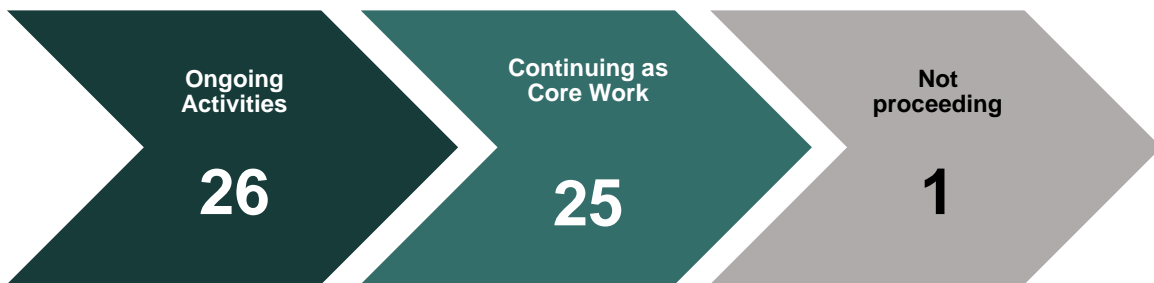
WSP Implementation Plan Results

Over the course of the implementation plan period (2018-2022), DFO has advanced monitoring of wild salmon stocks; habitat and ecosystem assessment, and monitoring; integrated strategic planning; and program delivery, working collaboratively with First Nations, the Province of British Columbia, the Yukon Territory, communities, industries, and non-governmental organizations. This section reviews the implementation results for all 54 activities identified in the Plan.

Overall, for the 28 activities with a target completion date, 20 were completed within the implementation period (as planned). For those eight that were not completed, key reasons included the impact of the COVID pandemic on the ability to conduct field work and the need to coordinate and compile complex information sources. Several of the incomplete activities are on track to be completed in 2023.



26 additional activities are ongoing. Only one activity—implementation of the regional Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries (2012)—is not continuing due to revised scope of the work. In many cases, work on these ongoing activities has evolved based on lessons learned through the implementation period. DFO remains committed to these activities based on the goal of the WSP to restore and maintain healthy and diverse salmon populations and their habitats.



Please see Annex B for detailed information on individual activity statuses and outcomes.

WSP Implementation Plan Achievements

This section reviews the status of all 54 activities identified in the Plan and Addendum, including key achievements and milestones throughout the implementation period. Activities are organized by theme and strategy under the WSP.

Theme 1: Assessment

The activities under this theme relate to the assessment and monitoring of Pacific salmon, their habitats, and ecosystems. Assessment work is considered the foundation of successful management and is a critical first step in integrated planning.

Strategy 1: Standardized Monitoring of Wild Salmon Status

Priorities to 2022:

- Identify benchmarks for CUs in three status zones – Green, Amber, Red
- Determine the current status zone for the CUs
- Continue to monitor and assess status of CUs

The WSP focuses on the CU as the scale of diversity to be maintained. Diversity among CUs is important, in part because it allows for diversity in responses to threats and environmental drivers such as climate change, contributing to the sustainability of the species and the ecosystem services they provide. Under Strategy 1, DFO made significant progress on standardizing methodologies for CU data collection, monitoring and assessments, including maintaining the authoritative database for all 462 currently identified CUs. The CU Description database is available on the [Open Government Data Portal](#), and will continue to be updated when revisions to the CU list or descriptions are made. A framework for reviewing and approving revisions was completed, peer-reviewed, and is available on the [Canadian Scientific Advisory Secretariat \(CSAS\) website](#). Additionally, a Salmon Data Reporting Strategy and Workplan was developed that will help to standardize data collection methods and tracking of resource allocations, accountabilities, and deliverables for monitoring programs.

DFO will continue to assess CUs and develop benchmarks, though data limitations have created challenges in this work. In order to address these challenges, new analytical methods were used and different types of data were evaluated (e.g., habitat capacity). For example, DFO scientists developed and evaluated a method for estimating benchmarks based on the percentile of observed spawner abundances (Holt et al. 2018), which may be useful for data-limited CUs. Furthermore, to understand the reliability of status assessments completed within the WSP, a [study](#) was done to look at how assumptions in data analysis bias assessment outcomes. Results from that study have lent “confidence to biological status assessments based on spawner abundances and spawner-recruitment analyses, even in the face of incomplete data” (Peacock et al. 2020).

Table 1. Implementation Plan Activities supporting WSP Strategy 1

Complete = This work is completed and no more work is planned at this point

In Progress = This work is still underway, but will not continue indefinitely

Ongoing = This work will be continuous or undertaken as needed as part of regular departmental work activities

WSP Strategy	WSP Action Step	Implementation Plan Activities to Support WSP Strategy and Action Step	Activity Status at end of Implementation Plan
1. Standardized monitoring of wild salmon status	1.1 Identify Conservation Units	Activity 1 – Maintain an authoritative database of CU descriptions, including biological and geographical attributes, and make it available to the public via the Government of Canada’s Open Data portal	Complete
		Activity 2 – Develop a framework for reviewing and approving revisions to CU descriptions	Complete
	1.2 Develop criteria to assess CUs and identify benchmarks to represent biological status	Activity 3 – Modify existing metrics or develop new metrics to address CUs that cannot be assessed with existing status assessment tools and subject modifications to CSAS review process	Ongoing
		Activity 4 – Document new methods for status assessments of CUs or groups of CUs and conduct peer review through the Canadian Scientific Advisory Secretariat (CSAS)	Ongoing
		Activity 5 – Develop a strategy to improve documentation of standards for data, methods, and reporting of monitoring programs	Complete
	1.3 Monitor and assess status of CUs	Activity 6 – Apply and refine an approach for identifying and prioritizing CUs or groups of CUs for biological status assessments	In Progress: Activity 6 was not completed within the Implementation Plan time frame but work on this activity will continue and PSSl investments will contribute to further refinement of prioritization scope.
		Activity 7 – Continue to monitor CUs on a priority basis, using indicator, intensive, and extensive monitoring approaches	Ongoing
		Activity 8 – Update NuSEDS database of spawner abundances linked to CUs and publish via the Open Data portal	Ongoing
		Activity 9 – Integrate research on the abundance, health, and condition of Fraser Sockeye during their migration in the marine environment from the mouth of the Fraser River through Johnstone Strait	In Progress: Activity 9 was not completed within the Implementation Plan time frame. Work on this activity will continue and is expected to be completed in the 2022-23 calendar year.
		Activity 10 – Work with Pacific Salmon Foundation (PSF) to enable better data transfer, availability, and delivery	Ongoing

Several Strategy 1 activities focused on continuing to collate and refine data, in order to help inform prioritization of CUs and Salmon Management Units (SMUs) – groups of CUs – for assessment and monitoring. For example, work is undertaken annually to enter data on spawner abundances at the CU level into the New Salmon Escapement Database (NuSEds); spawner abundance is an important consideration in prioritizing CUs and SMUs for assessment and monitoring. Additionally, substantial research has been undertaken on the abundance, health, and condition of Fraser Sockeye during their migration in the marine environment from the mouth of the Fraser River through Johnstone Strait. A final, peer-reviewed, research paper is expected in the 2023 calendar year and will provide science support for management decisions for Fraser Sockeye CUs.

Prioritization of CUs and SMUs remains an important part of WSP implementation. Sixty-nine SMUs were identified for implementation of the Fish Stocks Provisions of the revised *Fisheries Act* to enable a coordinated approach for program delivery and to reduce duplication and manage workload. The 69 SMUs will be used to group CUs for planning purposes, including the prioritization of CUs for biological status assessments. There is also now a better understanding of the work required to complete biological status assessments.

Strategy 2: Assessment of Habitat Status

Priorities to 2022 (for both Strategies 2 and 3):

- Identify a set of core environmental indicators associated with ecosystems
- Complete documentation on the Risk Assessment Method for Salmon (RAMS)
- Deliver the State of the Salmon Program to track and understand salmon trends
- Work with the Pacific Salmon Foundation on the Pacific Salmon Explorer

Under Strategy 2, work continues with the Pacific Salmon Foundation to document data on salmon habitat characteristics, and use this data to inform freshwater elements of risk assessments for wild Pacific salmon. Risk assessments for West Coast Vancouver Island (WCVI) freshwater habitats are complete, and are being used to identify potential actions and address key threats and limiting factors as part of the development of the WCVI Chinook rebuilding plan.

DFO will also continue to publish annual [State of the Pacific Ocean](#) reports. These reports include information on environmental conditions in the ocean, as well as a core set of environmental indicators that can be used to inform the upcoming year's salmon returns. Additionally, the 2019 State of the Salmon Report summarized environmental conditions for Pacific salmon in the past decade, and emphasized climate change as a key factor in deteriorating salmon trends. Climate change and adaptation to climate change is emerging in all State of the Salmon program work as a key factor now and going forward for salmon, pointing to the need for continued urgency in addressing this threat.

Finally, DFO has undertaken efforts to incorporate WSP objectives and considerations into Fish and Fish Habitat Protection Program (FFHPP) planning and decision-making that may affect wild Pacific salmon. Particular areas of focus have included identifying, gathering, and analyzing fish and fish habitat data; developing tools to map and report on the state of fish and fish habitat; developing a cumulative effects assessment framework within the context of regulatory reviews; providing technical advice and expertise to support habitat and watershed-based planning processes; and creating policies and frameworks to support

the development of effective restoration and offsetting projects as well as the establishment of Ecologically Significant Areas (ESAs). Regulatory activities to protect and conserve fish and fish habitat are also ongoing including review of development activities with the potential to affect fish and fish habitat, follow-up on occurrences, and compliance monitoring activities to ensure works, undertakings or activities are carried out in accordance with the *Fisheries Act*, *Species at Risk Act*, *Impact Assessment Act*, and *Aquatic Invasive Species Regulations*. This work is considered ongoing for the foreseeable future.

Table 2. Implementation Plan Activities supporting WSP Strategy 2

WSP Strategy	WSP Action Step	Implementation Plan Activities to Support WSP Strategy and Action Step	Activity Status at end of Implementation Plan
2. Assessment of habitat status	2.1 Document habitat characteristics within CUs	Activity 11 – Work with PSF to document salmon habitat characteristics	In Progress: Activity 11 was not completed within the Implementation Plan time frame but work on this activity will continue and completion is expected by the end of 2023.
		Activity 12 – Use information from Activity 11 regarding habitat status indicators to inform freshwater elements of a risk assessment framework in order to explain status and trend patterns exhibited by a CU or groups of CUs (e.g. WCVI Chinook)	In Progress: Activity 12 was not completed within the Implementation Plan time frame due to delays from COVID, but work on this activity will continue and is expected to be completed by 2023
		Activity 13 – Use results from Activity 12 to identify potential actions and address key threats and limiting factors in an integrated management rebuilding plan for subject CUs	Complete
	2.2 Select indicators and develop benchmarks for habitat assessment	Activity 14 – Assemble data, conduct analysis, and publish one or more reports to identify a core set of environmental indicators	Ongoing
	2.3 Monitor and assess habitat status	No Implementation Plan activities were specific to this Action Step	
	2.4 Establish linkages to develop an integrated data system for watershed management	No Implementation Plan activities were specific to this Action Step	
Additional Strategy Work	Activity 15 – Apply WSP objectives to all current and future Ecosystems Management Branch work that may affect wild Pacific salmon habitat	Ongoing	

Strategy 3: Inclusion of Ecosystem Values and Monitoring

Under Strategy 3, several activities centered on completing development of the Risk Assessment Methodology for Salmon (RAMS), which uses salmon life history and environmental information to identify management interventions to conserve, restore or enhance salmon CUs within a broader ecosystem. The methodology itself is nearing completion and publication, while RAMS workshop reports for 18 watersheds on the WCVI are published and available on the [West Coast Aquatic Roundtables](#) web site. The information from these workshops supported the development of a summary rebuilding plan for [Cowichan Chinook](#).

Another set of activities under Strategy 3 focused on building on the State of the Salmon Program work identified under Strategy 2. The program’s ongoing work to integrate and track salmon and environmental conditions in freshwater and marine environments is particularly important to understand large changes occurring in salmon populations and their ecosystems. The Pacific Salmon Status Scanner (the Scanner) was also created by the State of the Salmon Program and functions as an interactive data visualization tool to annually assess CU statuses. This tool will help with tracking and observing salmon patterns as they rapidly respond to climate change, and other stressors. Information from the Scanner will feed into salmon climate change vulnerability assessments, which are critical to understanding which salmon populations are most and least likely to retain some level of production going forward.

In 2021, the Salish Sea Marine Survival Project published a [full synthesis report](#) that summarizes work to “identify the primary factors affecting the survival of juvenile Chinook, Coho, and Steelhead in the Salish Sea marine environment” (Pearsall et al. 2021). For this project, DFO led the basin wide sampling and research projects for examining the distribution and condition of juvenile salmon in the Strait of Georgia, contributed information on the abundance and spatial distribution of salmon juveniles within the Salish Sea, and participated in the efforts to synthesize existing information into the final report. The report provides several recommendations for management actions and priority research. Moving forward, the juvenile salmon information provided to this project will support part of DFO’s core annual juvenile salmon monitoring program.

Table 3. Implementation Plan Activities supporting WSP Strategy 3

WSP Strategy	WSP Action Step	Implementation Plan Activities to Support WSP Strategy and Action Step	Activity Status at end of Implementation Plan
3. Inclusion of ecosystem values and monitoring	3.1 Identify indicators to monitor status of freshwater ecosystems	Activity 16 – Publish report on Risk Assessment Method for Salmon (RAMS) to assess potential for disturbance events or regimes in freshwater & marine ecosystems to control CU status and trend patterns	In Progress: Activity 16 was not completed within the Plan time frame but work on this activity is expected to be completed in spring 2023.
		Activity 18 – Use results from Activity 17 to identify potential actions and address key threats and limiting factors in any rebuilding plans for subject CUs (e.g. WCVI Chinook)	Complete
		Activity 19 – State of the Salmon Program to assess status and trends of salmon and associated environmental conditions in freshwater and marine ecosystems	Ongoing

3.2 Integrate climate and ocean information into annual salmon management processes	Activity 17 – Publish report(s) on results from initial application(s) of RAMS from one or more workshops (e.g. Cowichan Chinook, Barkley Sockeye)	Complete
	Activity 20 – Assemble environmental data to assess potential for interactions among climate, ecosystems, and habitat state to control status and trend patterns exhibited by priority CUs in representative biogeoclimatic zones	Ongoing
	Activity 21 – Report on indicator utility to compare the role(s) of major freshwater and marine ecosystem drivers in controlling status and trend patterns exhibited by data rich CUs and associated CU aggregates originating from two or more major biogeoclimatic zones in Canada’s Pacific Region	Complete
	Activity 22 – Provide salmon and environmental time series information (e.g. coast-wide Sockeye indicators) to State of the Ocean meeting	Ongoing
	Activity 23 – Develop options and recommended actions through the Salish Sea Marine Survival Project to address human threats and biological limiting factors affecting survival of Chinook and Coho in the Salish Sea	Complete
Additional Strategy Work	Activity 24 – Support ongoing national and provincial initiatives and increase interagency communication on cumulative effects assessment and management issues pertaining to shared aquatic ecosystem values	Complete

Spotlight on Jurisdictional Collaboration

Activity 24 centred on the goal to support ongoing national and provincial initiatives and increase interagency communication on cumulative effects assessment and management issues pertaining to shared aquatic ecosystem values. Several meetings were held between jurisdictions throughout 2018-19, and DFO continues to engage with the Province of BC and with national colleagues to advance discussions on cumulative effects considerations.



Theme 2: Maintaining and Rebuilding Stocks

The Maintaining and Rebuilding Stocks theme details work regarding progressive and integrative planning and annual program delivery, including how information from assessment activities can be used to manage, maintain, and rebuild stocks and habitats.

Strategy 4: Integrated Strategic Planning

Priorities to 2022:

- Develop an initial set of long-term strategic plans (rebuilding) for prioritized Red CUs/MUs
- Complete recovery potential assessments for the COSEWIC assessed salmon species/stocks, and begin SARA Recovery Strategies, Action Plans and Management Plans for SARA listed species
- Investigate new research tools to diagnose and study disease and other conditions affecting wild salmon
- Continue to inform, develop, and implement sustainable aquaculture measures to mitigate impacts to wild salmon

A large portion of the Plan's activities fall within Strategy 4, emphasizing the importance of integrating information into DFO's numerous planning and management processes to ensure their alignment with the WSP goal and objectives. Two activities were focused on incorporating information on CU status and habitat status into the Integrated Fisheries Management Planning (IFMP) process for Pacific salmon. These activities will continue, so that planning decisions continue to be informed by the best available information.

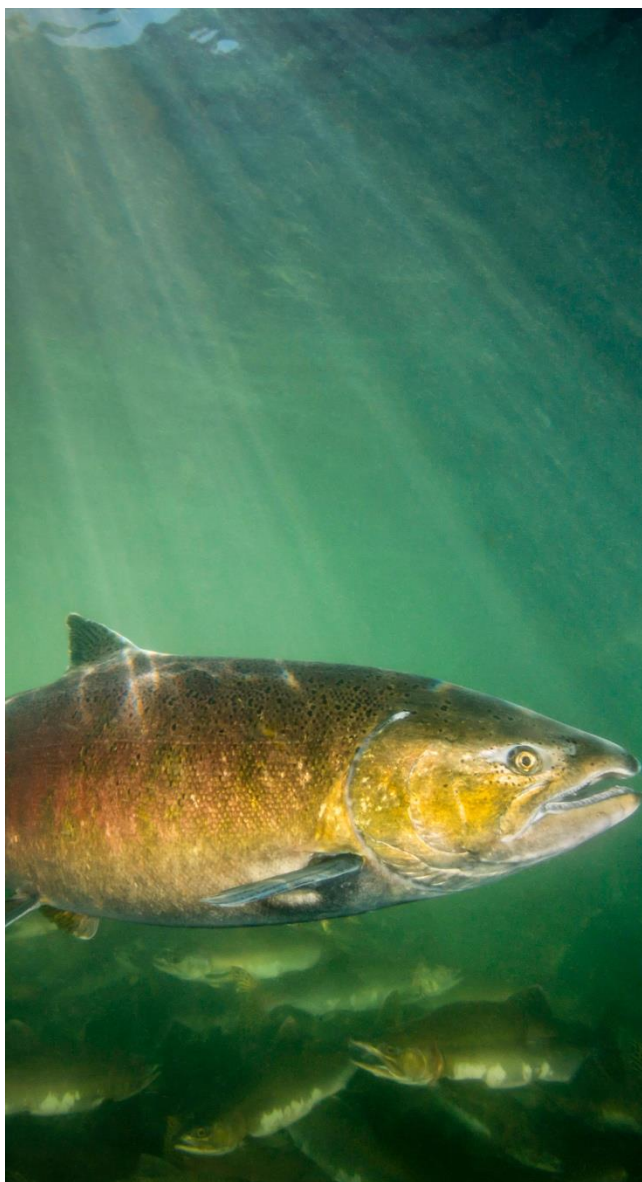
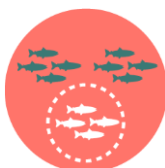
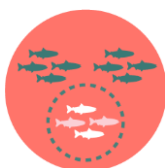


Photo: Eiko Jones - Female Chinook Salmon (*Oncorhynchus tshawytscha*)

Several different types of 'units' exist to categorize wild Pacific salmon, all of which are used in various assessment, regulatory, and management processes. The Wild Salmon Policy established the Conservation Unit as the level at which salmon diversity would be assessed and management. Since 2005, DFO has identified 462 Conservation Units in BC, though it is important to note that that number may fluctuate over time as data and methods are reviewed and refined.

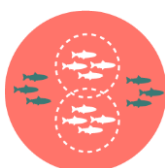


Conservation Unit (CU): A group of wild salmon sufficiently isolated from other groups that, if extirpated, is very unlikely to re-establish naturally within an acceptable time frame, such as a human lifetime or a specified number of salmon generations.



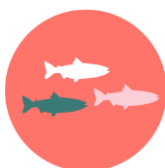
Designatable Unit (DU): Species, subspecies, variety, or geographically or genetically distinct population that may be assessed by COSEWIC, where such units are both discrete and evolutionarily significant.

COSEWIC uses DUs to recognize and assess units of Canadian wildlife below the 'species' level. There are 62 DUs of Pacific salmon, as of October 2022.



Stock Management Unit (SMU): A group of one or more CUs that are managed together with the objective of achieving a joint status.

DFO uses SMUs for planning purposes, including hatchery production planning, stock rebuilding, ecosystem monitoring and fishery management. Use of SMUs does not preclude considerations related to conserving CU-level diversity, but rather, SMUs are a practical aggregation of CUs for planning and reporting purposes. For example, SMUs are the scale at which management and assessment procedures, are developed in Integrated Fisheries Management Plans (IFMPs). In many cases, elements of the Precautionary Approach are implemented at finer scales of organization within a SMU. There are 69 SMUs of Pacific salmon, as of October 2022, representing 409 CUs.



Major Fish Stock: A unit of fish prescribed under Schedule IX Major Stock List of the Fish Stocks Provisions of the *Fisheries Act*.

Stocks prescribed under this schedule are subject to rebuilding requirements if the Minister of Fisheries, Oceans and the Canadian Coast Guard has knowledge that the major fish stock had declined to or below its limit reference point. There are three Pacific Salmon SMUs prescribed under the Schedule IX

Several activities advanced salmon rebuilding efforts in the implementation plan period, including: a peer review process to provide Science advice on guidance for methodology to establish limit reference points for salmon and progress on developing a rebuilding plan for WCVI Chinook and Okanagan Chinook. Much of

this work remains ongoing and DFO recognizes that there is significant and sustained public interest in SARA processes and salmon rebuilding plans.

Table 4. Implementation Plan Activities supporting WSP Strategy 4

WSP Strategy	WSP Action Step	Implementation Plan Activities to Support WSP Strategy and Action Step	Activity Status at end of Implementation Plan
4. Integrated strategic planning	4.1 Implement an interim process for management of priority CUs	Activity 25 – Include information on CU status considerations in IFMPs	Ongoing
		Activity 26 – Publish guidance outlining how DFO responds to Red CUs	In Progress: Activity 26 was not completed within the Implementation Plan time frame but work on this activity will continue and will be linked to national guidance for rebuilding plans under the Fish Stock Provisions of the Fisheries (General) Regulations.
		Activity 27 – Improve incorporation of existing available habitat and ecosystem status information into IFMPs	Ongoing
		Activity 28 – Complete recovery assessments and identify rebuilding options for any COSEWIC assessed salmon species/stocks	Ongoing
	4.2 Design and implement a fully integrated strategic planning process for salmon conservation	Activity 29 – Map CUs, freshwater and marine ecosystems, Fishery Management Units, and Outlook Units to clarify connections and nesting by Spring 2023	Complete
		Activity 30 – Develop fishery reference points and associated decision rules that consider biological and other factors for harvest management, as priority and capacity permits	Ongoing
		Activity 31 – Develop a WCVI Chinook rebuilding plan	In Progress: Activity 31 was not completed within the Implementation Plan time frame but work on this activity will continue and is expected to be completed in spring 2023.
		Activity 32 – Upon SARA listing of any Pacific salmon Designatable Units, initiate recovery planning processes	Ongoing: No Pacific salmon are listed under SARA
	Additional Strategy Work	Activity 33 – Advance Pacific North Coast Integrated Management Area (PNCIMA) implementation, building upon PNCIMA plan in an Ecosystem-Based Management framework	Ongoing:
		Activity 34 – Document Salmon Enhancement Program (SEP) activity by CU (enhancement, community involvement, habitat restoration)	Ongoing: Activity 34 was listed in the Implementation Plan as having a Completion Date of June 2019; it has subsequently

			determined that this work is evergreen in nature, and is therefore better captured as Ongoing.
		Activity 35 – Continue to implement transparent planning processes for hatchery production taking into account the WSP objectives of wild salmon conservation and sustainable fisheries	Complete
		Activity 36 – Investigate new research tools to diagnose and study disease and other conditions affecting wild salmon	Ongoing
		Activity 37 – Continue to co-lead the genomic research for the Strategic Salmon Health Initiative	Complete
		Activity 38 – Complete scientific research and a risk assessment process with respect to risk of net-pen salmon farms in the Discovery Islands area to migrating Fraser River Sockeye Salmon	Ongoing
		Activity 39 – Review requirements for salmon farms to ensure risks to wild salmon are minimized	Complete
		Activity 40 – Ensure mandatory reporting related to the Aquaculture Activities Regulation	Ongoing

Another major set of activities under Strategy 4 center around aquaculture, both from a science and a management perspective. For example, DFO scientists conducted investigations into new research tools to diagnose and study disease and other conditions affecting wild salmon. Examples of this research include using molecular tools to identify salmon in a viral disease state, using advanced genomic techniques to support the development of diagnostic tests for pathogens, and investigating the effects of pathogens on hosts. The Salmon Strategic Health Initiative, which has now evolved into the Salmon Ecological Health Program in partnership with the Pacific Salmon Foundation, has also been investigating cumulative effects of environmental stress and disease using new technologies and tools. Additionally, CSAS-led risk assessments were completed to provide DFO science advice regarding the risk of net-pen salmon farms in the Discovery Islands area to migrating Fraser River Sockeye salmon. The risk assessments provided information on nine pathogens from aquaculture operations in the Discovery Islands area. The completed risk assessments are available online [here](#).

From a management perspective, DFO has undertaken activities focused on mitigating and reducing the risks related to interactions between farmed salmon and wild salmon in the marine environment, including reviewing and improving marine finfish conditions of licence; strengthening the introductions and transfers review process as it pertains to marine finfish aquaculture; and, ensuring mandatory reporting related to the Aquaculture Activities Regulation. The Framework for Aquaculture Risk Management (FARM) was released in 2019 as a national guidance document which describes DFO’s aquaculture-specific risk management framework and outlines how and when the precautionary approach is used in aquaculture management. The second iteration of FARM incorporates changes based on comments from Indigenous groups, interest groups, and stakeholders. It was drafted in the spring of 2021, and is expected to be released shortly. Strengthening the licencing and transfer regime, along with the work of the FARM, have been important

steps in meeting the WSP objectives of maintaining habitat and ecosystem integrity, and managing fisheries for sustainable use, as they related to marine finfish aquaculture. Lastly, the Aquaculture Activities Regulation requires all licensed aquaculture facilities to complete annual reporting on drug and pesticide deposits and benthic monitoring. DFO will continue to participate in the collection and tracking of annual reports and industry data submission, and engagement with industry around mandatory reporting is ongoing.

Hatchery production (enhancement) is one of three tools the Department can use to support at-risk wild salmon populations (the others being harvest management and habitat management); however, applied incorrectly, it can negatively impact wild populations. DFO carefully plans production lines to mitigate risks to wild salmon, including documenting hatchery enhancement in a regional database by CU. These can then be scaled up to interface with restoration projects and activities by watershed. Work is ongoing to document and map community involvement activities through a Pacific Restoration Tracker.

Additionally, production planning discussions have taken place to inform how enhancement can be used for conservation, rebuilding, and sustainable fisheries, including through the West Coast Vancouver Island Chinook rebuilding plan process.

Strategy 5: Annual Program Delivery

Priorities to 2022:

- Continue to assess the status of salmon populations
- Continue to plan and conduct annual fisheries through Integrated Fisheries Management Plans
- Continue to encourage and support partners (First Nations, community partners and other stakeholders) in habitat management through DFO programming and with the Province of BC and Yukon Territory
- Continue to plan and implement annual salmon enhancement

A key focus of Strategy 5 is increasing alignment between the Salmon Enhancement Program (SEP) and the WSP. The Plan identified several activities to advance this work. For example, DFO implemented an integrated hatchery production planning process into the IFMP consultation process, and the production planning framework has been updated to reflect this integration. Additionally, over the past five years, the Department has looked to the newest hatchery science to inform production planning and decision-making. In advancing hatchery modernization, the Department is using funding under PSSI to support additional science around fish culture, including staffing more veterinarian, genetics, and research science positions. Work continues on creating biological goals for hatchery influence on wild populations for each line of production planning, based on [CSAS advice](#) regarding hatchery genetic management guidelines.

Table 5. Implementation Plan Activities supporting WSP Strategy 5

WSP Strategy	WSP Action Step	Implementation Plan Activities to Support WSP Strategy and Action Step	Activity Status at end of Implementation Plan
5. Annual program delivery	5.1 Assess the status of Conservation Units and populations	Activity 41 - Assess the value of annual lake stock assessments and monitoring programs for fall fry populations in the Fraser Basin with the goal of increasing work from two to four lakes annually	Complete
	5.2 Plan and conduct annual fisheries	Activity 42 – Work towards implementation of Fisheries Monitoring and Catch Reporting Framework to incorporate risk-based standards and monitoring of harvester-funded programs	Revised: Activity 42 has been revised to fall within DFO's National Fisheries Policy.
	5.3 Plan and implement annual habitat management activities	No Implementation Plan activities were specific to this Action Step	N/A
	5.4 Plan and implement annual enhancement activities	Activity 43 – Develop explicit biological goals for hatchery-influence on populations	Complete
		Activity 44 – Continue to implement transparent decision making framework for hatchery production in fishery planning processes that takes into account WSP objectives, balancing of risks of genetic effects, and the socio-economic benefits of increased stock abundance	Complete
		Activity 45 – Implement annual enhancement programs that utilize emerging science on hatchery-wild interactions	Ongoing

Another activity in Strategy 5 focused on incorporating risk-based standards and monitoring of harvester-funded programs into the Pacific Fisheries Monitoring and Catch Reporting Framework. DFO released the National Fishery Monitoring Policy in 2019, replacing the regional framework, and further assessments will be completed under the national Fishery Monitoring Policy Work Plan, available [here](#).

Spotlight on DFO's Lakes Research Program

Under Activity 41, DFO's Lakes Research Program aimed to assess the value of annual lake stock assessments and monitoring programs for fall fry populations in the Fraser Basin, with the goal of increasing the number of juvenile Sockeye salmon surveys within the Fraser River watershed from two to four lakes. DFO staff have expanded field work to include four fry productivity lake assessments in any given year as part of a larger rotational scheme that targets dominant Sockeye years. In 2021-22, juvenile Sockeye salmon abundance surveys were conducted in five salmon nursery lakes within the Fraser Basin (Fraser, Francois, Bowron, Chilliwack, and Cultus).



The value of annual lake-based fish and aquatic ecosystem monitoring (hydroacoustic/trawl surveys, limnology surveys) and research is continually demonstrated by the direct inclusion of Lakes Research Program-generated data in numerous management and planning processes. The continuation of these assessments over time has generated foundational reference datasets spanning 40+ years, reflecting substantial environmental changes. Moreover, science advice arising from these activities directly serves a broad array of internal and external clients/partners and Indigenous nations.

DFO's Lakes Research Program can be deployed across the Pacific Region, and the rotational framework of assessment can be scaled and implemented for all CUs, providing core information to manage populations, natal habitats, and fisheries.

Theme 3: Accountability

The Accountability theme commits DFO to completing activities and reporting publicly on progress to ensure that activities and governance structures in the Plan are operationalized and effective. This will enable DFO to adjust activities to better meet the WSP goal over time.

Strategy 6: Performance Review

Priorities to 2022:

- Public reporting on the WSP Implementation Plan
- Update the WSP Implementation Plan, as necessary, based on renewed *Fisheries Act*

The activities under Strategy 6 focused on tracking progress on the Implementation Plan activities through annual reporting, as well as undertaking a five-year report of the Plan. Four annual reports were completed, along with this five-year review. The Annual Reports are available online [here](#).

Table 6. Implementation Plan Activities supporting WSP Strategy 6

WSP Strategy	WSP Action Step	Implementation Plan Activities to Support WSP Strategy and Action Step	Activity Status at end of Implementation Plan
6. Performance review	6.1 Conduct post-season review of annual workplans	No Implementation Plan activities were specific to this Action Step	N/A
	6.2 Conduct regular reviews of the success of the WSP	Activity 46 – Coordinate annual WSP implementation reporting, and publish annual report on the DFO website	Complete
		Activity 47 – Coordinate 5-year reporting and publish 5-year review report on the DFO website	Complete
	Additional Strategy Work	Activity 48 – Coordinate the addition of activities into the WSP Implementation Plan based on renewed <i>Fisheries Act</i>	Complete

WSP Implementation Plan Addendum

In 2019, DFO published *An Addendum to the Wild Salmon Policy Implementation Plan (2018-2022)*, following royal assent of Bill C-68, which modernized the *Fisheries Act*. This addendum, which is captured under Activity 48, identified six more activities required to ensure that programming under the renewed *Fisheries Act* would be developed in alignment with the WSP goal and objectives. All of the activities in the addendum were given completion dates in the 2021-22 fiscal year, however, most of these activities are better characterized as ongoing in nature, and work will continue past the end of the Implementation Plan timeframe.

In April 2022, amendments to the Fishery (General) Regulations were published in the [Canada Gazette, Part II](#), establishing the first stocks prescribed under Schedule IX Major Stock List of the Fish Stocks Provisions. Three of the six addendum activities are associated with these provisions; work is ongoing to coordinate implementation of these new provisions including developing rebuilding plans, and to determine a methodology for establishing Limit Reference Points for SMUs comprised of multiple CUs.

Table 7. Implementation Plan Activities supporting Plan Addendum

Relevant Fisheries Act Sections	Addendum Activity	Activity Status at end of Implementation Plan
Fish Stocks Provisions	Activity 49 – DFO Pacific Science to provide advice on methodology to estimate Limit Reference Points for salmon Stock Management Units comprised of one or more CUs	Complete
	Activity 50 – Translate the National Guidance on Fish Stock Provision Rebuilding Plans for application to Pacific salmon in a manner consistent with the WSP	In Progress: Activity 50 is not complete, as the amendments to the Fishery (General) Regulations to establish the Schedule IX list of Major Fish Stock only occurred in April 2022. Work will continue on this activity throughout 2022 to align national guidance in a manner consistent with the WSP.
	Activity 51 – Coordinate implementation of Fish Stocks Provisions for prescribed stocks of Pacific salmon	Ongoing: Activity 51 was listed in the Implementation Plan as having a Completion Date of March 2022; it has subsequently been determined that this work is evergreen in nature as WSP implementation continues, and is therefore better captured as Ongoing.
	Activity 52 – Study Coho salmon habitat use, productivity, and response to land use change in the North Thompson watershed	Ongoing: Activity 52 was listed in the Implementation Plan as having a Completion Date of March 2022; it has subsequently been determined that this work is evergreen in nature as WSP implementation continues, and is therefore better captured as Ongoing.
Habitat Protection Provisions	Activity 53 – Engagement with external partners and stakeholders on Cumulative Effects, Habitat Offsetting and Banking, Prescribed Works and Waters Regulations, <i>Fisheries Act</i> Registry, Codes of Practice and Engagement Framework	Ongoing: Activity 53 was listed in the Implementation Plan as having a Completion Date of March 2022; it has subsequently been determined that this work is evergreen in nature as WSP implementation continues, and is therefore better captured as Ongoing.
Terms and Definitions	Activity 54 – Review and update the WSP Implementation Plan to ensure consistency of definitions with the renewed <i>Fisheries Act</i>	Ongoing: Activity 54 was listed in the Implementation Plan as having a Completion Date of March 2022; it has subsequently been determined that this work is evergreen in nature as WSP implementation continues, and is therefore better captured as Ongoing.

Another area of focus related to the renewed *Fisheries Act* is the continuing engagement related to policy development under the Habitat Protection Provisions and overall alignment and consistency of terms between the *Fisheries Act* and the WSP. Through strategic planning and using the best available data, the Fish and Fish Habitat Protection Program (FFHPP) will continue to engage with partners to identify and act on priority protection and restoration activities that can benefit salmon. This work will further DFO's ability to address threats to salmon through data sharing and co-development of spatial GIS tools. Partnerships are also being leveraged to begin planning for salmon recovery and protection at both the watershed and sub-regional scales.

Are we closer to the WSP's goals and objectives?

The goals and objectives of the WSP remain relevant and urgent. Since the Plan was published, there has been considerable progress in characterizing salmon stocks and understanding the invaluable genetic diversity represented in 462 CUs. DFO has produced annual reports on key performance indicators under the Plan, in part to help gauge and track whether activities committed to under the Plan have led to improved conditions for salmon populations and their habitats. This work has included quantitative performance indicators, which complement qualitative and narrative information, as well as the work being conducted in various science forums. These indicators support a greater understanding of the Department's overall efforts on assessment and monitoring, as well as integrated strategic planning to support the restoration and maintenance of healthy salmon populations and their habitats. This information is included in the key performance indicator table below.

Table 8. WSP Performance Indicator Results, 2018-2022

2018-19	2019-20	2020-21	2021-22	Performance Indicators & Current Data	Data Source
9.1%	9.1%	9.1%	9.1%	% of salmon CUs (in Canadian Science Advisory Secretariat assessments) that have WSP biological benchmarks and CU status assessment results ¹	Science
45.2%	45.2%	45.2%	45.2%	Of the salmon CUs that have WSP biological benchmarks and CU status assessment results, % that are in the WSP cautious (amber) and healthy (green) zones ²	Science
27	27	29	29	# of salmon SMUs that have harvest control rules outlined in salmon Integrated Fisheries Management Plans ³	Fisheries Management
63%	N/A	65%	66.7%	% of salmon CUs have at least one annual Escapement Estimate within 2017-2021 ⁴ available in the central database (NuSEDS) ⁵	Science
85%	90%	94%	95%	% of enhanced salmon that directly support DFO objectives for harvest, stock assessment and conservation (salmon production from major facilities)	Salmonid Enhancement Program
81%	76%	78%	76%	% of enhanced salmon that directly support DFO objectives for harvest, stock assessment and conservation (salmon production through community facilities under the contribution program)	Salmonid Enhancement Program
95%	97.3%	96.4%	96.4%	% of salmon aquaculture facilities in Pacific Region that had reported no high risk Fisheries Act violations in 2020-216	Aquaculture Program

¹ 42 out of 462 CUs. 22 Sockeye, 5 Coho, 15 Chinook, not including Data Deficient or TBD.

² 19 of 42 CUs assessed. 11 Sockeye, 5 Coho, 3 Chinook, not including Data Deficient, TBD or red/amber classifications.

³ For 2021-22, harvest control rule status is reported for the 69 Stock Management Units (SMUs) as opposed to the 53 fishery based Management Units (MUs) in previous reports. The major difference in reporting scale is for Chinook salmon where SMUs (20 in total) are defined at an aggregate CU scale while most MUs (10 in total) are defined on a largely mixed stock fishery scale. Additional SMUs were created when MUs were disaggregated into geographic components (e.g. for Nass and Skeena Pink and Chum). Of the 69 SMUs, 29 have harvest control rules (including removal references and abundance based management reference points) as outlined in IFMPs – 11 Sockeye, 10 Chinook, 1 Pink, 5 Chum and 2 Coho. An additional 23 SMUs have management approaches that respond to stock status in a precautionary manner but do not have fully developed reference points or harvest control rules documented in the IFMP including – 8 Chinook, 7 Pink, 6 Coho and 2 Chum. For the remaining 17 SMUs, harvest control rules are not outlined in IFMPs but fisheries targeting these stocks are based on fixed exploitation not adjusted in season, limited stock abundance information or are subject to long term closures.

⁴ Some 2021 data has yet to be received and entered into NuSEDS, but the most complete recent time period is 2017-2021.

⁵ There are multiple populations for most CUs, so an annual CU estimate does not mean that the CU is “completely” or “adequately” estimated. Some missing data may be due to unavoidable time delays in entering CU estimates into NuSEDS. NuSEDS estimates only include CU definitions that are currently in use and not in “retired” status.

⁶ C&P conducts thorough investigations on high risk Fisheries Act violations and their associated regulations. High risk occurrences are identified through industry reporting and audits performed by DFO Aquaculture Fishery Officers and Fishery Guardians. Fishery Officers are tasked to investigate high risk occurrences which may not result in charges. For the purposes of this document, the performance indicator is based on reported high risk violations only, and not the result of the investigation. High risk is defined as activities that could impact fish or fish habitat.

Despite some challenges, significant strides have been made in advancing our collective understanding of salmon populations in BC and Yukon over the course of the implementation period. COVID-19 led to delays of field work and data collection needed to advance certain activities, while the Big Bar landslide, and climate change-induced threats like extreme heat, wildfires, and floods meant DFO staff and resources had to shift priorities numerous times during the implementation period to respond to these threats to salmon and their habitats. Additionally, the 2019 amendments to the *Fisheries Act*, and specifically the inclusion of the Fish Stocks Provisions, has led to additional work to align CUs and SMUs with major fish stocks specified under Schedule IX of the Fishery (General) Regulations. As of April 2022, three salmon stocks have been prescribed into regulation – West Coast Vancouver Island Chinook, Okanagan Chinook, and Interior Fraser Coho. Work will continue to ensure that, for salmon prescribed through this regulatory process, WSP status assessments and strategic planning processes are aligned with identified Limit Reference Points and rebuilding plans for any stocks below their Limit Reference Point. Additionally, COSEWIC has assessed 62 salmon DUs, and designated 43 as at-risk. The Species at Risk Program is now working with colleagues in Fisheries Management, Science, FFHPP, the new Salmon Stewardship Directorate created under PSSI, BC, Wildlife Management Boards, and Indigenous groups to develop listing advice that will support the Governor in Council in deciding on whether or not to list the DUs assessed as at risk under SARA. Ongoing work and coordination are required between the SARA processes, Fish Stocks Provisions requirements, strategic planning, and rebuilding efforts under PSSI, and continued implementation of WSP strategies.

Despite significant progress under the Plan, many salmon populations are continuing to experience serious declines. Efforts to date, including sustained harvest reductions over the past 30 years, have not been successful in reversing these declines. Pacific Salmon landed value data from 1952 - 2020 show substantial declines in both total landings and in landed value (Figure 1).

Landed Value (2020\$) and Landings (Tonnes) of Pacific Salmon by Species 1952 to 2020

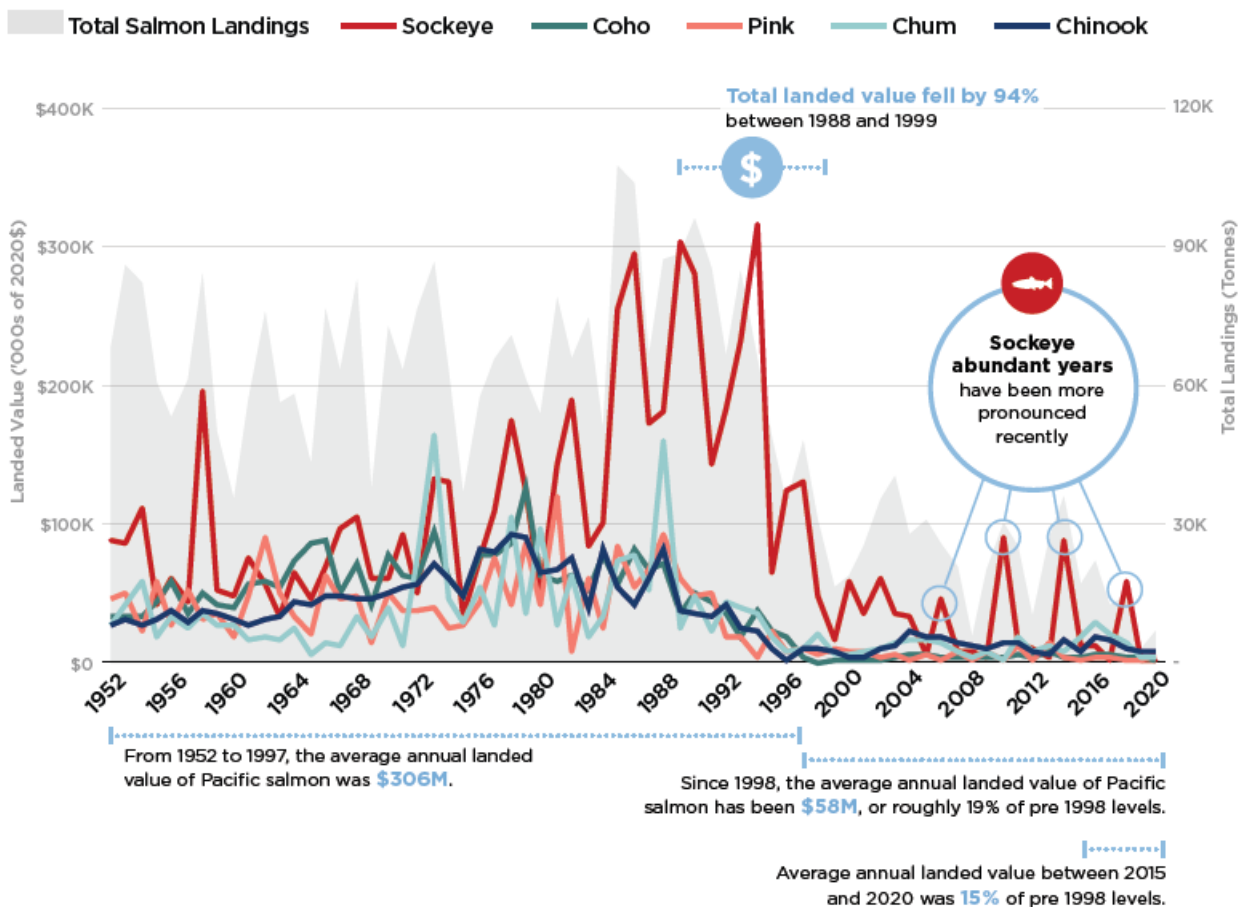


Figure 1. Sources: 1952 to 1995 data is taken directly from <https://www.pac.dfo-mpo.gc.ca/stats/comm/ann/index-eng.html>; Data for 1996-2020 taken from DFO Internal Data

Some general trends in Canadian Pacific salmon abundances are emerging, as outlined in DFO’s 2019 *State of Canadian Pacific Salmon* report. Chinook numbers are generally declining throughout their BC and Yukon range, with the exception of average to above average returns in Lower Georgia Strait. Sockeye and Coho numbers are also declining, most notably at southern latitudes. Salmon that spend less time in freshwater, like river-type Sockeye, ocean-type Chinook, odd year Pink, and Chum are generally doing better, though in recent years Chum have also started to return in poorer numbers in British Columbia. In work done by the State of the Salmon Program, climate change has been identified as the key driver of salmon population trends, affecting the freshwater and marine ecosystems that salmon use throughout their lives. Prolonged marine heatwaves are reducing the quality of food for salmon near the base of their food webs. Summer river temperatures are more frequently too warm for salmon. These climate related effects will generally increase over time, and impacts will vary by salmon population based on the unique ecosystems, fisheries, and other factors salmon experience cumulatively over their lives. Factors such as habitat changes, fisheries, disease, and pollutants can act alone or cumulatively to affect salmon population trends, and they are all embedded within this climate change context.

Pacific Salmon Strategy Initiative

Given the scope of challenges facing wild Pacific salmon, particularly the growing effects from climate change and related factors, DFO recognizes that a bold and targeted response with concrete actions is required to effectively address the steeply declining trends in many Pacific salmon populations, and rebuild the species where possible. Budget 2021 announced an historic and transformational investment of over \$740M over five years for the PSSI which will advance targeted actions through four key pillars:

1. **Conservation and Stewardship:** improved habitat monitoring and assessment, and integrated salmon ecosystem planning and restoration with partners.
2. **Salmon Enhancement:** support salmon conservation, rebuilding, and targeted fishing opportunities through new hatchery facilities and enhanced scientific expertise.
3. **Harvest Transformation:** transformation of salmon fisheries to improve stability and resilience in the harvest sector.
4. **Integration and Collaboration:** integration across federal salmon activities; collaboration through enhanced partnerships with Indigenous, provincial, territorial, and international governments.

The PSSI builds on and supports the years of engagement, consultations, and work that Indigenous communities, commercial and recreational fishers, grassroots organizations, scientists, and others have contributed towards the protection and recovery of Pacific salmon. Together, concurrent work under the four pillars provide a holistic framework, which is further supported by five horizontal principles: **Indigenous Reconciliation; Innovative Solutions; Prioritization; Enhanced Transparency, Data and Trust; and Partnerships and Collaboration.**

With funding and authorities in place and, foundational actions taken, including broad initial engagement, PSSI is now in its implementation stage, with initial activities underway to address multiple drivers of Pacific salmon stock declines, including climate change, through new strategic investments, and early salmon rebuilding activities. The PSSI Secretariat has designed a five-year implementation strategy and pathway to results which outlines priority areas of action. By the end of the 2022-23 fiscal year, the PSSI Secretariat expects to have determined an initial short list of prioritized SMUs to be the focus of initial rebuilding planning, with a target of having plans developed and guiding prioritized DFO rebuilding activities by 2026.

Through the PSSI, an enhanced focus on engagement and collaboration with First Nations, as well as engagement with other levels of governments, harvesters, environmental non-governmental organizations, communities, academia, and others, will enable greater collaboration on actions that will have the greatest impact towards shared Pacific salmon conservation objectives.

Early engagement on PSSI took place over 2021-22, with a focus on how First Nations, partners, and stakeholders want to be engaged. By Spring 2022, more than 80 general engagement meetings had been held. The meetings provided an overview of the PSSI's vision, pillars, themes, intended outcomes, and overall engagement approach, and helped provide insights and feedback to inform PSSI implementation planning going forward. As more work under the Initiative is advanced, further engagement has and will continue to be undertaken, in some cases using new enhanced collaborative processes focussed on Pacific salmon conservation and rebuilding.

Since Pacific salmon recovery depends on many factors, it is important to understand that collective efforts to rebuild Pacific salmon stocks will take time to fully show results. Recognizing this time frame, the PSSI will have a combination of short, medium and long-term milestones to ensure we are making meaningful progress in conserving and rebuilding Pacific salmon and salmon habitat. Through PSSI, further work is also being advanced on a more robust Pacific salmon performance measurement approach beyond 2022. The Department has undertaken initial work on milestones and targets for DFO salmon activities over the next five years, with further refinement expected as the implementation details are determined in collaboration with First Nations and other partners.

This report marks the end of the current phase of WSP implementation and helps set the stage for continued implementation of the WSP in the context of PSSI. To that end, the WSP will continue to guide and inform DFO's work on Pacific salmon. Many elements of the PSSI are grounded in the WSP and the Implementation Plan more specifically, as well as informed by WSP consultations with First Nations and stakeholders.

Table 9 below, as well as the subsequent narrative, highlights key links between WSP Strategies and Action Steps and PSSI Initiatives and Themes. New PSSI investments and activities will complement and build on the foundation of Pacific salmon efforts to date under the Plan and beyond, and continue to complement and advance the goal and objectives of the WSP.

Table 9. WSP Strategies and Action Steps with Linked PSSI Pillars

WSP Strategies	Action steps	PSSI Linkage
1. Standardized monitoring of wild salmon status	<ul style="list-style-type: none"> • Identify Conservation Units • Develop criteria to assess CUs and identify benchmarks to represent biological status • Monitor and assess status of CUs 	Pillar: Conservation and Stewardship Theme: Habitat Monitoring and Assessment
2. Assessment of habitat status	<ul style="list-style-type: none"> • Document habitat characteristics within CUs • Select indicators and develop benchmarks for habitat assessment • Monitor and assess habitat status • Establish linkages to develop an integrated data system for watershed management 	Pillar: Conservation and Stewardship Theme: Habitat Monitoring and Assessment
3. Inclusion of ecosystem values and monitoring	<ul style="list-style-type: none"> • Identify indicators to monitor status of freshwater ecosystems • Integrate climate and ocean information into annual salmon management processes 	
4. Integrated strategic planning	<ul style="list-style-type: none"> • Implement an interim process for management of priority CUs 	Pillar: Conservation and Stewardship Theme: Integrated Planning and Restoration

	<ul style="list-style-type: none"> Design and implement a fully integrated strategic planning process for salmon conservation 	<p>Pillar: Integration and Collaboration Theme: Integration Across Federal Salmon Activities</p>
5. Annual program delivery	<ul style="list-style-type: none"> Assess the status of CUs and populations Plan and conduct annual fisheries Plan and implement annual habitat management activities Plan and implement annual enhancement activities 	<p>Pillar: Conservation and Stewardship Theme: Habitat monitoring and assessment Theme: Integrated planning and restoration</p> <p>Pillar: Salmon Enhancement Theme: Enhancement – Conservation Focused Theme: Enhancement – Harvest Focused</p> <p>Pillar: Harvest Transformation Theme: Harvest Transformation – Indigenous Theme: Harvest Transformation – Commercial Theme: Harvest Transformation – Recreational</p>
6. Performance review	<ul style="list-style-type: none"> Conduct post-season review of annual workplans Conduct regular reviews of the success of the WSP 	<p>Pillar: Integration and Collaboration Theme: Integration Across Federal Salmon Activities Theme: Collaboration Through Enhanced Partnerships</p>

WSP Strategy 1: Standardized Monitoring of Wild Salmon Status

Much of the key work under WSP Strategy 1 has been completed, or will be ongoing through existing programs and funding. Four hundred and sixty-two CUs have been identified, along with a methodology to revise CU descriptions and identifications as needed. While only 9.1% of CUs have WSP biological benchmarks and CU status assessment results, assessments are ongoing. Salmon stocks and CUs are also monitored annually, and available monitoring data is used in status assessments. PSSI will support further targeted actions being taken on prioritized Pacific salmon stocks through conservation and rebuilding measures. Priority Pacific salmon populations are protected and restored through targeted action in collaboration with partners.

WSP Strategy 2: Assessment of Habitat Status and WSP Strategy 3: Inclusion of Ecosystem Values and Monitoring

Through additional targeted science and improved data integration under PSSI, work under the Conservation and Stewardship pillar will help better our understanding of salmon ecosystems – rivers, estuaries, migration paths, stressors, and their interactions– to drive effective decision-making around ecosystem planning and habitat restoration. Initiatives within themes of Habitat Monitoring and Assessment and Integrated Planning and Restoration under the Conservation and Stewardship pillar will build upon work completed or still underway within WSP Strategy 2, in order to ultimately inform inclusion of ecosystem values and monitoring (WSP Strategy 3) into Integrated Salmon Ecosystem Planning processes, as well as rebuilding plans for prioritized stocks. These planning processes will utilize information including habitat

characteristics and ecosystem status, to identify and help prioritize management actions to be undertaken by DFO and partners to support better outcomes for salmon and their habitats. Inclusion of climate change information from the State of the Salmon Program in planning processes, for example, is of particular importance as the need to better understand climate change adaptation is emerging as a key factor now and going forward for salmon.

WSP Strategy 4: Integrated Strategic Planning

The PSSI will be advancing integrated strategic planning for salmon conservation, stewardship, and collaboration with key partners. There are two pillars relevant to the integrated strategic planning actions. First, the Conservation and Stewardship pillar aims to improve habitat monitoring and assessment and integrated ecosystem planning and restoration, together with partners. Second, the Integration and Collaboration pillar aims to improve outcomes from federal Pacific salmon activities, based on clearer priorities and improved collaboration and coordination with First Nations and Indigenous organizations, as well as the Province of British Columbia and Yukon Territory, other salmon partners, and stakeholders. Work under the Integration and Collaboration Pillar will also support improved integration of activities across the other three PSSI pillars.

Another key linkage is between WSP Strategy 4 and the new DFO Salmon Stewardship Directorate, including a Centre of Expertise for Salmon Habitat Restoration launched as part of PSSI. Both new initiatives recognize and reflect the importance of bringing together information on Pacific salmon stock status, habitat and ecosystem status and limiting factors, and threats from human and non-human sources in order to develop truly integrated strategic planning for salmon conservation and rebuilding. PSSI's Salmon Stewardship Directorate also includes establishment of an Integrated Salmon Rebuilding Unit within DFO Pacific Region, which will be responsible for developing and initiating integrated rebuilding/conservation plans for an initial set of prioritized stocks by 2026.

DFO is also developing new mechanisms to promote more effective collaboration and support the important work of partner organizations, which will help enhance the effectiveness of salmon stewardship, rebuilding, and habitat restoration projects across Pacific region. The Integration and Collaboration pillar of PSSI aims to improve outcomes from federal Pacific salmon activities, based on clear priorities and improved collaboration and coordination with First Nations and Indigenous organizations, as well as relevant provincial and territorial partners, and salmon stakeholders.

WSP Strategy 5: Annual Program Delivery

PSSI will continue to support and expand DFO's previous Pacific salmon program delivery. Action steps under WSP Strategy 5 will be further advanced and are well-aligned to key activities under three PSSI pillars: Conservation and Stewardship, Salmon Enhancement, and Harvest Transformation.

Assessing the status of CUs and populations, in addition to planning and implementing annual habitat management activities will be advanced under the Conservation and Stewardship pillar. For example, under this pillar, PSSI will be making investments in research, stock assessment, habitat restoration, and enforcement.

The WSP also recognizes that enhancement can be a useful conservation tool for sustaining wild salmon. Much of the work under the Salmon Enhancement pillar is similarly focused on conservation; PSSI initiatives will focus on hatchery production as a management tool to support the conservation and rebuilding of fragile Pacific salmon stocks, and support sustainable fishing opportunities for harvest. In order to mitigate potential concerns on the impacts of hatchery activities on wild salmon and genetic diversity, DFO will employ a variety of measures including increased oversight and governance, increased scientific tools and expertise, and increased technology and policy support.

Planning and implementing annual enhancement activities will be advanced under the PSSI's Salmon Enhancement pillar. Under this pillar, a new Pacific salmon enhancement policy framework is being developed, which will align salmon enhancement with hatchery reform and the broader DFO vision for Pacific salmon. Guided by this new framework, new investments will allow hatcheries to be built, and experts have been working to identify potential locations for the new conservation hatcheries. Additionally, improvements and retrofits of existing hatcheries will continue into 2022-23 and beyond.

With regard to the PSSI's Harvest Transformation pillar, initiatives including commercial fishery closures, Salmon Allocation Policy renewal, and modernized management approaches for Indigenous, commercial, and recreational salmon fisheries, will support the overarching goal of the WSP, while informing how, where, when, for what purpose, and by whom salmon fishing is carried out in the future. Changes aim to make fisheries more selective, improve fishery monitoring, and provide tools to make fisheries more adaptable in the face of changing conditions. These management initiatives will be an important consideration in developing and implementing conservation-focused integrated strategic salmon plans, both under the PSSI and for plans developed under the WSP.

Working Together

The WSP notes that, in order to make implementation work, the Department cannot and should not act alone. Success is dependent on collaboration between everyone who has an interest in wild Pacific salmon. In alignment with WSP principles for working together, PSSI recognizes the value and importance of partnerships with Indigenous peoples, as well as provincial/territorial governments, harvesters, community groups, stewardship partners, academia, environmentalists, and other stakeholders in working towards our common goal of stemming historic Pacific salmon declines. The PSSI has several sub-initiatives, particularly under the Integration and Collaboration Pillar aimed at strengthening external governance and advisory mechanisms that will inform decision-making and advance Pacific salmon conservation and management outcomes.



WSP Strategy 6: Performance Review

Several PSSI sub-initiatives under the theme of Integration and Collaboration pillar are closely linked with WSP Strategy 6. Moving forward, PSSI is committed to enhanced transparency and accountability on Pacific salmon program delivery and meaningful tracking towards results. The Department will report on activities undertaken and establish clear performance measures. These reports will be informed by integrated PSSI program monitoring and evaluation activities, coordinated by the new PSSI Secretariat within DFO. Moreover, this new group is leading development of a Pacific salmon results strategy in response to findings of the 2021 [Evaluation of DFO's Activities in Support of Pacific Salmon](#) conducted by DFO. The evaluation calls for the development of a strategic direction, vision, and clear results for Pacific salmon, improved integrated governance, and enhanced coordination for tracking resources and transfer payments (i.e. grants and contributions programs) in support of Pacific salmon. Work to respond to all five of the key recommendations of the evaluation are currently underway.

Other Regional Initiatives Supporting Salmon Rebuilding

BC Salmon Restoration and Innovation Fund Update

The BC Salmon Restoration and Innovation Fund (BCSRIF) was launched on March 15, 2019. BCSRIF is a cost-shared federal/provincial program that supports the protection and restoration of wild Pacific salmon and other BC fish stocks, as well as projects to ensure the fish and seafood sector in BC is positioned for long-term environmental and economic sustainability. When the program was originally launched, total funding amounted to \$142.85 million over five years, with 70% of the funding being provided by the federal government and 30% coming from the Province of BC. Due

to sustained, high interest in the Fund, and early results from funded projects, Budget 2021 committed to doubling the federal funding to BCSRIF with an additional \$100 million committed as a key initiative under the PSSI. The third BCSRIF application intake closed on November 15, 2022 with the next suite of funding recommendations anticipated early in the fiscal year 2023-2024

Prior to each application intake, joint funding priorities established to reflect DFO and BC's interests and support current government priorities. Examples of projects include:

- **K'omoks First Nation** and partners will return an abandoned industrial site in the heart of their traditional territory back into functioning habitat. The former industrial sawmill is situated in the heart of the salmon migration corridor for the watersheds of two major rivers: the Puntledge and the Tsolum. The restoration of this site will improve access to Food, Social and Ceremonial uses of salmon, provide increased recreational fishing opportunities, and support the recovery of Southern Resident Orca populations.



- **Ducks Unlimited Canada** will work with partners to implement three large-scale projects to restore key Fraser River estuary tidal marsh habitat and access to these critical habitats for the benefit of COSEWIC-assessed Fraser River Chinook, Coho, Steelhead, and Sockeye salmon populations, as well as other juvenile salmon populations, white sturgeon, and other wild BC fish stocks. These efforts aim to reverse the effects of human-caused impacts to the Fraser River estuary, which, combined with the anticipated future effects of sea-level rise, severely impair ecological resilience and wild BC salmon survival.
- The **Gitanyow Fisheries Authority** will undertake small scale enhancement and habitat restoration projects to maximize spawner success over the next five years and to identify the limiting factors to Kitwanga sockeye production. The goal of the project is to identify and develop solutions to ultimately stop and reverse the decline of Kitwanga sockeye and help rebuild the stock.
- The **Pacific Salmon Foundation** will work with partners to create a Climate Action Plan for BC salmon through three initial project components: developing improved genetic baselines to understand genetic differences at a scale finer than CUs; developing a 'Playbook' to guide landscape recovery strategies and priorities for salmon following major fires; and assessing Fraser River migration impediments.

Under the expanded program, BCSRIF will continue to prioritize research and restoration projects, as well as other activities that provide benefits to salmon, such as the eradication of Aquatic Invasive Species and sustainable fishing methodologies that reduce impacts to non-target stocks. Strong partnerships, incorporation of Indigenous Knowledge, and the development of new and innovative strategies in response to climate change and evolving environmental factors will continue to be key elements of successful BCSRIF projects.

Big Bar Landslide

On June 23, 2019, a significant landslide was reported in a remote, rugged canyon along the Fraser River near Big Bar, north of Lillooet, British Columbia, on the traditional territory of the Secwepemc Nation. Huge pieces of rock and substantial debris sheared off from a 125-metre cliff and crashed into the river, creating a five-metre waterfall. Further analysis confirmed that approximately 110,000 cubic metres (m³) of debris fell into the river. This barrier prevented migrating Pacific Fraser salmon from moving beyond the landslide to reach their spawning grounds, thus impacting the reproductive cycle of several key Upper Fraser salmon populations.

Working with First Nations partners and the Province remains an integral part of [DFO's response](#) to the Big Bar landslide. In 2021, more normal water levels and improvement to the "nature-like" fishway allowed over 1.9 million fish to migrate past the slide site without assistance. However, there remains a problem that will challenge passage 10-25% of the time.



Aerial Photo of Big Bar Landslide taken on July 10, 2019. Photo Courtesy of: Province of British Columbia

Between February and March 2021, multiple rock fall incidents and extreme weather impacted crew safety at the work site and forced a halt to further work on the permanent fishway. Installation of a permanent fishway, as originally designed, was determined to be no longer possible by May 2022 due to slope stability issues and the challenges posed by the extreme weather conditions. In the immediate-term, and through summer 2022, the plan is to continue with the best available solution, which is transporting fish from below the slide site to closer to their spawning areas above the landslide. We will learn from our experiences so far to ensure a higher rate of survival for the salmon. Though not ideal, this represents the most effective means of preserving the genetic diversity of these salmon populations in the short-term. The emergency enhancement of at-risk upper Fraser salmon stocks and a comprehensive monitoring program remain integral parts of the response efforts.

Work is currently underway on the first phase of a Structured Decision Making process to determine a long-term solution for restoring fish passage for early arriving stocks at Big Bar. DFO, in partnership with First Nations and the Province of BC, continues to collaborate as an integrated team.

Conclusion

DFO is continuing to move forward with our commitment to conserve and rebuild wild salmon populations, alongside key partners. The work DFO has undertaken to implement the WSP makes it well-positioned to support requirements under the modernized *Fisheries Act*, and also sets a solid foundation for the PSSI moving forward. This work, along with the efforts by so many others in BC and the Yukon, is an important step toward reaching the evergreen goal of restoring and maintaining diverse salmon populations for the benefit of the people and ecosystems of Canada in perpetuity. At the same time, ongoing environmental and climate change issues, plus unforeseen challenges, such as the Big Bar landslide and the COVID-19 pandemic, are contributing to shape the broader context for salmon restoration and conservation efforts. These and other challenges will require constant learning, reflection, and adaption in our efforts to conserve and rebuild Pacific salmon populations for future generations.

Let's Talk Pacific Salmon

Have your say on DFO strategies and programs related to Pacific salmon at <https://letstalkpacificsalmon.ca/>.



Annex A: Wild Salmon Policy Implementation Plan

Resources and Acronyms

Legislative and Policy Resources

Canada's Oceans Now: [Canada's Oceans Now \(2020\) \(dfo-mpo.gc.ca\)](#)

Canadian Science Advisory Secretariat: [Canadian Science Advisory Secretariat \(CSAS\) \(dfo-mpo.gc.ca\)](#)

Cowichan Watershed Health and Chinook Initiative: [Action Plan for Rebuilding Cowichan Chinook](#)

Government of Canada Open Data Portal: [Open Data | Open Government, Government of Canada](#)

Modernized *Fisheries Act*: [A modernized Fisheries Act for Canada \(dfo-mpo.gc.ca\)](#)

North Pacific Anadromous Fish Commission: [International Year of the Salmon](#)

NuSEDS – New Salmon Escapement Database System: NuSEDS-New Salmon Escapement Database System - Open Government Portal (canada.ca)

Pacific Region Integrated Fisheries Management Plans: [Integrated Fisheries Management Plans](#)

[Pacific Salmon Strategy Initiative: Pacific Salmon Strategy Initiative \(dfo-mpo.gc.ca\)](#)

Regulations Amending the Fishery (General) Regulations: [Canada Gazette, Part 2, Volume 156, Number 8: Regulations Amending the Fishery \(General\) Regulations](#)

Salish Sea Marine Survival Project – Research Findings: [Research Findings - Salish Sea Marine Survival Project](#)

Salmonid Enhancement Program Production Planning: A Framework: [SEP production planning: a framework / Salmonid Enhancement Program. - Catalogue - Canada.ca](#)

Species at Risk Act: [Species at Risk Act \(justice.gc.ca\)](#)

State of the Pacific Ocean Reports: <https://www.dfo-mpo.gc.ca/oceans/soto-rceo/pacific-pacifique/index-eng.html>

Wild Salmon Policy: [Wild Salmon Policy 2018 to 2022 Implementation Plan | Pacific Region | Fisheries and Oceans Canada \(dfo-mpo.gc.ca\)](#)

Wild Salmon Policy 2018-2022 Implementation Plan: [Canada's Policy for Conservation of Wild Pacific Salmon | Pacific Region | Fisheries and Oceans Canada \(dfo-mpo.gc.ca\)](#)

Wild Salmon Policy Implementation Plan Highlights, 2005-2017: [Wild Salmon Policy implementation plan highlights, 2005 to 2017 | Pacific Region | Fisheries and Oceans Canada \(dfo-mpo.gc.ca\)](#)

Wild Salmon Policy Implementation Plan Annual Reports: [Wild Salmon Policy Implementation Plan annual reports | Pacific Region | Fisheries and Oceans Canada \(dfo-mpo.gc.ca\)](#)

Sustainable Fisheries Framework: [Sustainable Fisheries Framework Workplans](#)

Selected Scientific Publications

- Atlas, W.I., Selbie, D.T., Holt, C.A., Cox-Rogers, S., Carr-Harris, C., Pitman, K.J. and Moore, J.W. (2020) [Landscape and biophysical controls of lake productivity to inform evaluation of sockeye salmon \(*Oncorhynchus nerka*\) populations in data-limited regions](#). *Limnology and Oceanography*, 65: 2205-2219.
- Bahri, T., Vasconcellos, M., Welch, D.J., Johnson, J., Perry, R.I., Ma, X. & Sharma, R., eds. (2021) [Adaptive management of fisheries in response to climate change](#). *FAO Fisheries and Aquaculture Technical Paper No. 667*. Rome, FAO.
- DFO. (2021) [Science Guidelines to Support Development of Rebuilding Plans for Canadian Fish Stocks](#). *DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2021/006*.
- DFO. (2018) [The 2017 Fraser Sockeye Salmon \(*Oncorhynchus nerka*\) integrated biological status re-assessment under the Wild Salmon Policy](#). *DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/017*.
- DFO. (2016) [Integrated Biological Status of Southern British Columbia Chinook Salmon \(*Oncorhynchus tshawytscha*\) Under the Wild Salmon Policy](#). *DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2016/042*.
- DFO. (2015) [Wild salmon policy biological status assessment for conservation units of interior Fraser River Coho Salmon \(*Oncorhynchus kisutch*\)](#). *DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2015/022*.
- Grant, S.C.H., MacDonald, B.L., Winston, M.L. (2019) [State of Canadian Pacific Salmon: Responses to Changing Climate and Habitats](#). *Canadian Technical Report of Fisheries and Aquatic Sciences 3332*.
- Irvine, J.R., Chapman, K., Park, J. (2019) Technical Report 13, [Report of the Proceedings for the IYS Workshop: International Year of the Salmon Workshop on Salmon Status and Trends](#). *North Pacific Anadromous Fish Commission*.
- MacDonald, B.L., Grant, S.C.H., Wilson, N., Patterson, D.A., Robinson, K.A., Boldt, J.L., King, J. Anderson, E., Decker, S., Leaf, B., Pon, L., Xu, Y., Davis, B., & Selbie, D.T. (2020) [State of the Salmon: Informing the survival of Fraser Sockeye returning in 2020 through life cycle observations](#). *Canadian Technical Report of Fisheries and Aquatic Science 3398*: v + 76 p.
- Peacock, S., Hertz, E., Holt, C.A., Connors, B, Freshwater, C. and Connors, K. (2018) [Evaluating the consequences of common assumptions in run reconstructions on Pacific-salmon biological status assessments](#). *Canadian Journal of Fisheries and Aquatic Sciences*. Volume 77, Number 12.
- Pearsall, I., Schmidt, M., Kemp, I., Riddell, B. (2021) [Factors Limiting Survival of Juvenile Chinook Salmon, Coho Salmon and Steelhead in the Salish Sea: Synthesis of Findings of the Salish Sea Marine Survival Project](#). *Pacific Salmon Foundation*.
- Withler, R.E., Bradford, M.J., Willis, D.M., and Holt, C. (2018) [Genetically Based Targets for Enhanced Contributions to Canadian Pacific Chinook Salmon Populations](#). *DFO Can. Sci. Advis. Sec. Res. Doc. 2018/019*. xii + 88 p.
- Wade, J., Hamilton, S., Baxter, B., Brown, G., Grant, S.C.H., Holt, C., Thiess, M., and Withler, R. (2019) [Framework for reviewing and approving revisions to Wild Salmon Policy conservation units](#). *DFO. Can. Sci. Advis. Sec. Res. Doc. 2019/015*. v + 29 p.

Select Abbreviations

- **BCSRIF:** BC Salmon Restoration and Innovation Fund
- **COSEWIC:** Committee on the Status of Endangered Wildlife in Canada
- **CSAS:** Canadian Science Advisory Secretariat
- **CU:** Conservation Unit
- **DU:** Designatable Unit
- **DFO:** Fisheries and Oceans Canada
- **FFHPP:** Fish and Fish Habitat Protection Program
- **IFMP:** Integrated Fisheries Management Plan
- **LRP:** Limit Reference Point
- **MPA:** Marine Protected Area
- **NuSEDS:** New Salmon Escapement Database Systems
- **RAMS:** Risk Assessment Method for Salmon
- **RPA:** Recovery Potential Assessment
- **SARA:** *Species at Risk Act*
- **SEP:** Salmon Enhancement Program
- **SMU:** Stock Management Unit
- **SSHI:** Strategic Salmon Health Initiative
- **PSF:** Pacific Salmon Foundation
- **PSSI:** Pacific Salmon Strategy Initiative
- **WCVI:** West Coast Vancouver Island
- **WSP:** Wild Salmon Policy

Annex B: WSP Implementation Plan Activity Status

This is the detailed companion document that outlines specific activity statuses and key work completed as of the end of the Implementation Plan timeline (2018-2022).

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
1	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.1: Identify CUs</p>	Maintain an authoritative database of CU descriptions, including biological and geographical attributes, and make it available to the public via the Government of Canada's Open Data portal	Science	31-Mar-19	Complete	<p>All current Conservation Unit (CU) descriptions are posted on the Open Government Data Portal. Should new CUs be described, the database will be updated as the information becomes available.</p> <p>Link: Open Government Portal (canada.ca)</p>
2	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.1: Identify CUs</p>	Develop a framework for reviewing and approving revisions to CU descriptions	Science	31-Mar-20	Complete	<p>The CU revision framework has undergone a full Canadian Scientific Advisory Secretariat (CSAS) review, and the published document is available online.</p> <p>Link: Research Document 2019/015 (dfo-mpo.gc.ca)</p>
3	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.2: Develop criteria to assess CUs and identify benchmarks for biological status</p>	Modify existing metrics or develop new metrics to address CUs that cannot be assessed with existing status assessment tools and subject modifications to CSAS review process	Science	Ongoing, as required	Ongoing	<p>Research updating the model to derive benchmarks of status from habitat models for Chinook salmon was completed in 2021-2022. Results from that work will be used in a CSAS Regional Peer Review Process on Limit Reference Points for Pacific Salmon. The model updates are tentatively planned to be published in a separate Technical Report (if not included in the CSAS Research Document on Limit Reference Points).</p> <p>Link: Evaluating Benchmarks of Biological Status for Data-limited Conservation Units of Pacific Salmon, Focusing on Chum Salmon in Southern BC</p> <p>Link: Landscape and biophysical controls of lake productivity to inform evaluation of sockeye salmon (<i>Oncorhynchus nerka</i>) populations in data-limited regions</p>

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
4	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.2: Develop criteria to assess CUs and identify benchmarks for biological status</p>	Document new methods for status assessments of CUs or groups of CUs and conduct peer review through the Canadian Scientific Advisory Secretariat (CSAS)	Science	Ongoing, as required	Ongoing	<p>Three projects for new methods development are underway: (1) a review of the data and development of benchmarks for Nass and Skeena Sockeye to meet both Wild Salmon Policy and Pacific Salmon Treaty objectives; (2) initiation of a project to develop biological benchmarks for Rivers Inlet Sockeye to inform First Nation Treaty allocations and meet Wild Salmon Policy objectives; and (3) research to reconstruct Canadian-origin Yukon Chinook abundances at the CU level and develop provisional benchmarks (Wild Salmon Policy), and an aggregate escapement goal to meet Pacific Salmon Treaty objectives. Additionally, the State of the Salmon Program has developed a Pacific Salmon Status Scanner to provide status for CUs region-wide.</p> <p>Link: The 2017 Fraser Sockeye Salmon (Oncorhynchus Nerka) Integrated Biological Status Reassessment under the Wild Salmon Policy</p>
5	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.2: Develop criteria to assess CUs and identify benchmarks for biological status</p>	Develop a strategy to improve documentation of standards for data, methods, and reporting of monitoring programs	Science	31-Mar-22	Complete	A Salmon Data Reporting Strategy and Workplan was completed in 2021. PSSI Investments have initiated further work to adapt and implement this plan.

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
6	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.3: Monitor and assess status of CUs</p>	Apply and refine an approach for identifying and prioritizing CUs or groups of CUs for biological status assessments	Science and Fisheries Management	31-Mar-20	Not Complete	<p>SMUs were identified for implementation of the Fish Stocks Provisions of the revised <i>Fisheries Act</i> to enable a coordinated approach for program delivery and to reduce duplication and manage workload. The 69 SMUs will be used to group CUs for planning purposes, including the prioritization of CUs for biological status assessments. There is now a better understanding of the work required to complete biological status assessments.</p> <p>The development, review and acceptance of a risk-based tool that applies to SMUs for the purpose of prioritizing status assessments has proven challenging due to the fact that this activity may require significant and ongoing coordination amongst sectors. One issue still to be resolved is the extent to which applying a prioritization tool is a collaborative process that engages stakeholders and the appropriate forum for doing so. Previous risk-based prioritization work for Management Units (MUs) may be helpful in informing prioritization efforts and existing tools could be refined for biological status assessments as well. Status assessments may require a tiered approach based on the intended use of the assessment in order to permit cost-effective prioritization efforts with available resources. It should be possible, in a relatively short period, to apply risk criteria/tools to SMUs using the Salmon Assessment Coordinating Committee for an initial internal review. Broader First Nation and stakeholder engagement will require a workshop approach.</p>
7	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.3: Monitor and assess status of CUs</p>	Continue to monitor CUs on a priority basis, using indicator, intensive, and extensive monitoring approaches	Science	Ongoing	Ongoing	Salmon stocks and CUs are monitored annually. Monitoring plans vary by Area and year, depending on the mix of stocks and expected return levels. The breadth and depth of these programs has improved with the implementation of new Pacific Salmon Treaty and associated resources in 2020. Tools to organize and track these programs in terms of resources and deliverables are under development through Activity 5.
8	<p>Strategy 1: Standardized Monitoring of Wild Salmon Status</p> <p>Action Step 1.3: Monitor and assess status of CUs</p>	Update NuSEDS database of spawner abundances linked to CUs and publish via the Open Data portal	Science	Ongoing	Ongoing	<p>Data are received and entered into NuSEDS throughout the year. The NuSEDS data view on the Open Data portal is refreshed annually and was refreshed in November 2021.</p> <p>Link: NuSEDS-New Salmon Escapement Database System - Open Government Portal (canada.ca)</p>

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
9	Strategy 1: Standardized Monitoring of Wild Salmon Status Action Step 1.3: Monitor and assess status of CUs	Integrate research on the abundance, health, and condition of Fraser Sockeye during their migration in the marine environment from the mouth of the Fraser River through Johnstone Strait	Science	31-Mar-22	Not Complete	The final, peer-reviewed paper associated with this activity is currently in draft form, and is expected to be completed within the 2022-23 fiscal year.
10	Strategy 1: Standardized Monitoring of Wild Salmon Status Action Step 1.3: Monitor and assess status of CUs	Work with Pacific Salmon Foundation (PSF) to enable better data transfer, availability, and delivery	Science	Ongoing	Ongoing	A DFO-PSF working group was established to support the Pacific Salmon Explorer tool and discussions are ongoing in relation to data availability and delivery to meet the objectives of PSF. This activity also relates to the DFO Pacific Salmon Data Management Strategy, which is under development, and is expected to improve DFO salmon data products and their accessibility. In addition, PSSI investments in data governance and management will enhance our ability to share data.
11	Strategy 2: Assessment of Habitat Status Action Step 2.1: Document habitat characteristics	Work with PSF to document salmon habitat characteristics	Science	31-Mar-21	Not Complete	Important habitat requirements by species are documented in various locations, some of it unpublished. Under PSSI, the information in these various locations these will be collated into a single resource. This work is expected to be completed by the end of 2023.
12	Strategy 2: Assessment of Habitat Status Action Step 2.1: Document habitat characteristics	Use information from Activity 11 regarding habitat status indicators to inform freshwater elements of a risk assessment framework in order to explain status and trend patterns exhibited by a CU or groups of CUs (e.g. WCVI Chinook)	Science	31-Mar-21	Not Complete	Expected completion in 2023. This activity is being completed on several fronts: PSF are reviewing habitat status indicators; the Province of BC is collaborating with DFO to measure and store data for habitat status indicators; and RAMS methodology will be formalized to define limiting factors and associated habitat status indicators that pose threats to salmon.
13	Strategy 2: Assessment of Habitat Status	Use results from Activity 12 to identify potential actions and address key threats and limiting factors in an	Fisheries Management and Science	31-Mar-22	Complete	Use of risk assessment methods to assess limiting factors and recommend management strategies are being expanded for additional populations and watersheds, including developing a process for marine habitat risk assessment. PSSI investments will increase capacity for this work.

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
	Action Step 2.1: Document habitat characteristics	integrated management rebuilding plan for subject CUs				
14	Strategy 2: Assessment of Habitat Status Action Step 2.2: Select indicators and develop benchmarks for habitat assessment	Assemble data, conduct analysis, and publish one or more reports to identify a core set of environmental indicators	Science	Ongoing	Ongoing	<p>The State of the Salmon report in 2019 summarizes environmental conditions for salmon in the past decade, and emphasized climate change as a key factor in deteriorating salmon trends.</p> <p>Link: State of the Salmon Report</p> <p>Annual State of the Pacific Ocean reports include environmental conditions in the ocean.</p> <p>Link: State of the Pacific Ocean</p> <p>Annual environmental outlooks for salmon are produced and published in the Northern and Southern Salmon IFMPs, which integrate freshwater and marine conditions up to the return year. The State of Salmon Program also provides these environmental outlook presentations at stakeholder and First Nations meetings and different science workshops.</p> <p>Link: Pacific Region IFMPs</p> <p>National State of Ocean reports include contributors from the Pacific and some specifics on salmon.</p> <p>Link: National State of the Oceans</p> <p>Climate change and adaptation for climate change is emerging in all this work as a key factor now and going forward for salmon. This is urgent work required and remains a gap internally.</p>

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
15	<p>Strategy 2: Assessment of Habitat Status</p> <p>Additional strategy work</p>	Apply WSP objectives to all current and future Ecosystems Management Branch work that may affect wild Pacific salmon habitat	Ecosystem Management	Ongoing	Ongoing	<p>FFHPP continues to work to identify, gather and analyze fish and fish habitat data; develop tools to map and report on the state of fish and fish habitat; develop a framework for assessment of cumulative effects within the context of regulatory reviews; provide technical advice and expertise to support habitat and watershed-based planning processes; and create policies and frameworks to support the development of effective restoration and offsetting projects as well as the establishment of Ecologically Significant Areas (ESAs). Regulatory activities to protect and conserve fish and fish habitat are also ongoing including review of development activities with the potential to affect fish and fish habitat, follow-up on occurrences, and compliance monitoring activities to ensure works, undertakings or activities are carried out in accordance with <i>the Fisheries Act, Species at Risk Act, Impact Assessment Act and Aquatic Invasive Species Regulations</i>.</p> <p>In line with the WSP Strategies 2 & 3, identifying a set of core environmental indicators associated with ecosystems, FFHPP has begun to work with the DFO Freshwater Science Research group to identify science-based indicators and metrics that can be used to assess the status (e.g. health or state) of habitat for specific CUs in the Pacific Region.</p>
16	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Action Step 3.1: Identify indicators to monitor status of freshwater ecosystems</p>	Publish report on Risk Assessment Method for Salmon (RAMS) to assess potential for disturbance events or regimes in freshwater & marine ecosystems to control CU status and trend patterns	Science	31-Mar-19	Not Complete	Draft documents on the Risk Assessment Method for Salmon (RAMS) methodology are complete. Documents include overview of the methodology and a guide/recipe for workshop implementation. Final versions of the documents are expected to be completed in spring 2023.
17	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Action Step 3.2: Integrate climate and ocean information into annual salmon management processes</p>	Publish report(s) on results from initial application(s) of RAMS from one or more workshops (e.g. Cowichan Chinook, Barkley Sockeye)	Science	31-Mar-20	Complete	<p>RAMS workshop reports for 18 watersheds on the WCVI are published and available on the West Coast Aquatic Roundtables web site.</p> <p>Link: West Coast Aquatic Roundtables</p>

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
18	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Action Step 3.1: Identify indicators to monitor status of freshwater ecosystems</p>	Use results from Activity 17 to identify potential actions and address key threats and limiting factors in any rebuilding plans for subject CUs (e.g. WCVI Chinook)	Fisheries Management, Science	31-Mar-21	Complete	<p>A summary plan for rebuilding Cowichan Chinook has been completed and is available online.</p> <p>Implementation of projects has occurred and continues to address key limiting factors (lack of water during key periods, lack of rearing habitat in the lower river, and high sediment load due to Stoltz Bluff). These include Stoltz Bluff remediation work to reduce sediment load in the river, creation of a significant new lower river rearing area as part of the Cowichan dykes remediation project, and discussions around a water use planning process to improve water management and increase storage in the lake through raising the height of the existing weir. Results for Cowichan River Chinook returns shows some success was achieved with spawning escapements exceeding the 6500 natural spawner targets in each of the last 5 years, from returns well below 1000 in 2009.</p> <p>Link: Action Plan for Rebuilding Cowichan Chinook</p>

Activity Number	WSP Strategy and Action Step	Activity Description	DFO Branch Lead	Target Completion Date	Status at end of WSPIP Timeline	Comments
19	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Action Step 3.1: Identify indicators to monitor status of freshwater ecosystems</p>	State of the Salmon Program to assess status and trends of salmon and associated environmental conditions in freshwater and marine ecosystems	Science	Ongoing	Ongoing	<p>The State of the Salmon Program published a report and e-book on salmon statuses, trends, and environmental conditions. Climate change has emerged as the key factor contributing to salmon trends now and these pressures will only increase into the future. This report includes several annual contributions on salmon trends: Sockeye indicators from Science’s Salmon in Regional Ecosystems Program; state of salmon in BC/Yukon; and, salmon distribution and trends in marine ecosystems by a number of research programs. Program staff also undertook research and published primary literature.</p> <p>Link: State of the Salmon Report</p> <p>Link: State of the Salmon e-book</p> <p>Annual Canadian salmon and ecosystem trends are presented at North Pacific Anadromous Fish Commission (NPAFC) meetings and published in annual reports:</p> <p>Link: North Pacific Anadromous Fish Commission Annual Reports</p> <p>DFO staff contributed to an International Year of the Salmon status report published across NPAFC member countries.</p> <p>Link: International Year of the Salmon Report 2019</p> <p>The Pacific Salmon Status Scanner (the Scanner) is an interactive data visualization tool the SOS Program has developed to assess rapidly annually statuses of salmon CUs. This work includes a geographic interface. It will be used to track salmon statuses annually, look for patterns in trends, and identify threats and vulnerabilities to climate change. It will track success of hatchery, harvest, management actions. This work links to habitat status work conducted by FFHPP, which is in early stages.</p>
20	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p>	Assemble environmental data (e.g. climate indices, ocean circulation indices, freshwater temperature, discharge, nutrient loads,	Science	Ongoing	Ongoing	<p>The State of the Salmon Program has assessed the status and trends of salmon and associated environmental conditions and has published annual reports. Further, the Program contributes updates to the annual State of the Pacific Ocean reports and the Salmon Outlook reports.</p>

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	Action Step 3.2: Integrate climate and ocean information into annual salmon management processes	primary production etc.) to assess potential for interactions among climate, ecosystems, and habitat state to control status and trend patterns exhibited by priority CUs (e.g., southern Chinook and Sockeye) in representative biogeoclimatic zones (e.g. Fraser, West Coast Vancouver Island)				
21	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Action Step 3.2: Integrate climate and ocean information into annual salmon management processes</p>	Report on indicator utility to compare the role(s) of major freshwater and marine ecosystem drivers in controlling status and trend patterns exhibited by data rich CUs and associated CU aggregates originating from two or more major biogeoclimatic zones in Canada's Pacific Region	Science	31-Mar-21	Complete	Information on the major drivers that impact the status and trend patterns of salmon CUs is provided in the annual State of the Salmon Reports and the State of the Pacific Ocean Reports. The reporting is part of the annual business cycle of the State of the Salmon Program.
22	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Action Step 3.2: Integrate climate and ocean information into annual salmon management processes</p>	Provide salmon and environmental time series information (e.g. coast-wide Sockeye indicators) to State of the Ocean meeting	Science	Ongoing	Ongoing	Multiple contributions are provided to the State of the Pacific Ocean meeting annually and are subsequently documented in the annual State of the Pacific Ocean reports. These contributions are part of the annual business cycle of the State of the Salmon Program.

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23	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Action Step 3.2: Integrate climate and ocean information into annual salmon management processes</p>	Develop options and recommended actions through the Salish Sea Marine Survival Project to address human threats and biological limiting factors affecting survival of Chinook and Coho in the Salish Sea	Science	1-Dec-19	Complete	<p>The Salish Sea Synthesis committee published the full synthesis and summary final reports in 2021.</p> <p>Link: Research Findings - Salish Sea Marine Survival Project.</p>
24	<p>Strategy 3: Inclusion of Ecosystem Values and Monitoring</p> <p>Additional strategy work</p>	Support ongoing national and provincial initiatives and increase interagency communication on cumulative effects assessment and management issues pertaining to shared aquatic ecosystem values	Policy and Economic Analysis	31-Mar-19	Complete	Several meetings were held throughout 2018-19 on aquatic ecosystems as a value to be assessed for the Province of BC's Cumulative Effects Framework. DFO is continuing engagement with the BC government on habitat issues, and with national colleagues on rebuilding plan discussions.
25	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.1: Implement an interim process for management of priority CUs</p>	Include information on CU status considerations in IFMPs	Fisheries Management, Science	Ongoing	Ongoing	All information available on completed status evaluations and integrated biological status designations are included in IMFPs. Progress on this activity will be linked to the completion of WSP integrated biological status assessments; as assessments are completed, information will be included in relevant IFMP sections.
26	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.1: Implement an interim process for management of priority CUs</p>	Publish guidance outlining how DFO responds to Red CUs	Fisheries Management, Science	31-Mar-22	Not Complete	National guidance for implementation of the Fish Stocks Provisions is anticipated to be available in the coming year, now that the amended Fishery (General) Regulations are approved. Work is ongoing to support application of this guidance for salmon and alignment with the WSP guidance for Red CUs.

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27	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.1: Implement an interim process for management of priority CUs</p>	Improve incorporation of existing available habitat and ecosystem status information into IFMPs	Fisheries Management	Ongoing	Ongoing	Overall, this project is being approached iteratively as information becomes available. More work is required to plan a strategic approach to expand information in the IFMP and also scope the material that should be included to support management processes. Cross-program coordination and integration may be developed through the Strategic Salmon Director's Committee. Some work could be coordinated through the State of the Salmon Program, with input from Fisheries Management.
28	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.1: Implement an interim process for management of priority CUs</p>	Complete recovery assessments and identify rebuilding options for any COSEWIC assessed salmon species/stocks	Ecosystem Management, Fisheries Management, Science	Ongoing	Ongoing	CSAS-led RPAs are complete (in some cases awaiting Research Document publication) for Sakinaw Sockeye, Okanagan Chinook, Interior Fraser Coho, Fraser Chinook (both enhanced and non-enhanced populations) and Fraser Sockeye (Group I). RPA processes are ongoing for WCVI Chinook and East Vancouver Island Chinook, with tentative completion targets in 2023. Additionally, Fraser Sockeye (Group II) were recently assessed by COSEWIC and referred to the Minister of Environment; DFO is in the early stage of scoping science advice needs.
29	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.2: Design & implement a fully integrated strategic planning process for salmon conservation</p>	Map CUs, freshwater and marine ecosystems, Fishery Management Units, and Outlook Units to clarify connections and nesting	Science	31-Mar-19	Complete	Maps of CUs and SMUs have been created, as well a CU/SMU/DU crosswalk table.
30	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.2: Design & implement a fully integrated strategic planning process for salmon conservation</p>	Develop fishery reference points and associated decision rules that consider biological and other factors for harvest management, as priority and capacity permits	Fisheries Management, Science	Ongoing	Ongoing	A CSAS peer review process was undertaken in March 2022 to provide Science advice on guidance for methodology to establish limit reference points for salmon. The process is being led by the national CSAS office in Ottawa with support from Pacific Region. The CSAS Science Advisory Report and Research Document arising from this meeting is expected to be published in the 2022-23 fiscal year.

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31	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.2: Design & implement a fully integrated strategic planning process for salmon conservation</p>	Develop a WCVI Chinook rebuilding plan	Science	2020	Not Complete	The risk assessment engagement process is nearly complete, 15 workshops have been completed and summary reports are expected by early 2023. Engagement regarding rebuilding goals for abundance and genetic diversity was conducted with the Huu-ay-aht First Nation on the Sarita River, which is now a mass marking and terminal mark selective fishery pilot. Further work has begun within the Five Nations and will expand to other Nuu-chah-nulth nations and WCVI round tables. Scientific backgrounder (Recovery Potential Assessment) will be complete by late winter 2022/23. This will allow engagement on recommendations within the rebuilding planning process. The rebuilding plan is expected to be completed in spring 2023.
32	<p>Strategy 4: Integrated Strategic Planning</p> <p>Action Step 4.2: Design & implement a fully integrated strategic planning process for salmon conservation</p>	Upon SARA listing of any Pacific Salmon Designatable Units (DUs), initiate recovery planning processes	Ecosystem Management	Ongoing	Ongoing	No salmon DUs were listed under SARA in 2021-22, therefore no SARA recovery planning processes were initiated.
33	<p>Strategy 4: Integrated Strategic Planning</p> <p>Additional strategy work</p>	Advance Pacific North Coast Integrated Management Area (PNCIMA) implementation, building upon PNCIMA plan in an Ecosystem-Based Management framework	Ecosystem Management	Ongoing	Ongoing	<p>As of January 2023, the following PNCIMA Plan implementation milestones have been reached:</p> <p>Governance (PNCIMA Plan priority 1):</p> <ul style="list-style-type: none"> • Establishment of trilateral governance for PNCIMA Plan implementation. This was done through an amendment to the Reconciliation Framework Agreement for Bioregional Oceans Management and Protection (Oceans RFA) to add the province of BC as a party to the agreement for matters under Schedule A and, where the parties agree, for matters under Schedule B. <p>Marine Protected Area (MPA) Network (PNCIMA Plan priority 2):</p> <ul style="list-style-type: none"> • From June 2021 through to June 2022, the partners collaboratively developed the draft Network Action Plan (NAP), which includes the draft network scenario 2, and a draft Socio Economic Overview, developed based on input from stakeholders and others in the previous fiscal year.

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						<ul style="list-style-type: none"> DFO and Province of British Columbia conducted First Nations consultation on the draft NAP through Fall, 2022. Network Partners conducted public engagement on the draft NAP from September to November 2022.
34	Strategy 4: Integrated Strategic Planning Additional strategy work	Document SEP program activity by CU (enhancement, community involvement, habitat restoration)	PSSI	Jun-19	Ongoing	All hatchery enhancement is documented in a regional database by CU. In 2020-21, SEP worked with other DFO teams to develop and populate the Pacific Restoration Tracker. This tracker maps restoration projects and activities supported by DFO's transfer payment programs. For ease and clarity (i.e. visual representation) restoration projects and activities are mapped by watershed. Additional work is required to complete the documentation of community involvement activities. SEP restoration activities are ongoing and adaptive, this documentation activity is considered evergreen and an integral and ongoing contribution to WSP implementation.
35	Strategy 4: Integrated Strategic Planning Additional strategy work	Continue to implement transparent planning process for hatchery production taking into account the WSP objectives of wild salmon conservation and sustainable fisheries	PSSI	1-Jul-19	Complete	Integrated production planning process for enhancement production has been implemented as part of the IFMP consultation process. In 2018 DFO updated its production planning framework to reflect this engagement step. Link: SEP Production Planning: A Framework
36	Strategy 4: Integrated Strategic Planning Additional strategy work	Investigate new research tools to diagnose and study disease and other conditions affecting wild salmon	Science	Ongoing	Ongoing	New tools and approaches are an ongoing research activity. Examples include: molecular tools to identify salmon in a viral disease state, advanced genomic techniques to support the development of diagnostic tests for pathogens, advanced genomic techniques to support the development of vaccines, investigation into the effects of pathogens on hosts, investigation into co-infection effects, examination of the impact of environmental factors on infection, tools to predict presence of specific stressors and stage of smolt readiness, and advanced genomic sequencing to determine origin of pathogens.
37	Strategy 4: Integrated Strategic Planning Additional strategy work	Continue to co-lead the genomic research for the Strategic Salmon Health Initiative	Science	Dec-19	Complete	This initiative has evolved to become the Salmon Ecological Health Program, which continues to involve partnership with Pacific Salmon Foundation. This program is applying a new genomic salmon Fit-Chip technology that can assess cumulative impacts of environmental stress and disease, as well as providing a tool to identify the optimal smolt window for salmon releases from hatcheries.

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						Application of this tool to 2500 sockeye salmon in 2021 has revealed that levels of thermal stress felt by salmon have increased dramatically in the Strait of Georgia over the past decade, and are highly correlated with rise in sea surface temperature. Salmon moving northward from the Strait, passing by farms in the Discovery Islands, are maximally stressed at a time when they come into contact with abundant infective agents from farm spillover, increasing their vulnerability to infection. Importantly, signatures of osmotic stress (inability to maintain salt balance) are strongly associated with signatures of imminent mortality (a morbidity signature that predicts death within 72 hours) in both fresh and salt water. Osmotic stress can come from poor adaptation to fresh or saltwater, or wounding such as predator bites, lamprey wounds, gill net scars, sea lice infection, <i>Tenacibaculum</i> infection and other sources. Which of these are most closely linked to elevated osmotic stress signatures in salmon along the coast is still under study, but clearly finding ways to mediate osmotic stress, such as optimizing release time of smolts from hatcheries (not a sockeye issue) and minimizing levels of sea lice and would go a long way to improving survivability. Multi-stressor laboratory challenge studies have similarly shown that osmotic stress is the stressor most closely linked with survival. Full smolts can withstand high temperatures and low oxygen environments, while presmolts and especially desmolts are highly sensitive to any further stress upon ocean entry. These trials have been carried out in Chinook and coho salmon, and will be continued in sockeye, pink and chum salmon in 2022-23. Importantly, the 2021 study in coho showed that it can take up to three days for a fish to fully recover from thermal stress.
38	Strategy 4: Integrated Strategic Planning Additional strategy work	Complete scientific research and a risk assessment process with respect to risk of net-pen salmon farms in the Discovery Islands area to migrating Fraser River Sockeye Salmon	Science	Ongoing	Ongoing	CSAS-led risk assessments were completed to provide DFO science advice on nine pathogens from aquaculture operations in the Discovery Islands area known to cause disease were completed and the results available publicly online Link: Summaries of the risk assessments for the Discovery Islands area
39	Strategy 4: Integrated Strategic Planning Additional strategy work	Review requirements for salmon farms to ensure risks to wild salmon are minimized	Fisheries Management, Science	30-Sep-19	Complete	The second iteration of the Framework for Aquaculture Risk Management (FARM), incorporating changes as a result of comments from Indigenous groups, and interest groups and stakeholders, was drafted in spring 2021. It is currently being further revised to reflect comments from provinces and territories. The updated document is expected to be published on the DFO website imminently. New marine finfish aquaculture licences for all facilities outside the Discovery Islands were reissued in June 2022 for a period of two years. These licences include stronger requirements for

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						<p>aquaculture facilities, including the implementation of standardized reporting requirements and sea lice management plans, as well as wild salmon monitoring, all of which will improve the management of the salmon aquaculture industry and help protect wild salmon stocks and their habitat.</p> <p>As well, considerations related to interactions between wild and farmed salmon continue to be strengthened through the development and implementation of new tools applied in the review of transfer applications by the Introductions and Transfers Committee (assessment forms, fish health attestations, disease agent assessments) and the inspection of fish to be transferred by DFO's Fish Health staff.</p>
40	<p>Strategy 4: Integrated Strategic Planning</p> <p>Additional strategy work</p>	Ensure mandatory reporting related to the Aquaculture Activities Regulation	Fisheries Management	Ongoing	Ongoing	<p>The Aquaculture Activities Regulation (AAR) requires all licensed aquaculture facilities to complete annual reporting on drug and pesticide deposits and benthic monitoring. DFO regional offices to participate in the collection and tracking of annual reports and industry data submission. Engagement with industry around mandatory reporting is ongoing.</p> <p>Regular reporting includes:</p> <ul style="list-style-type: none"> • Benthic monitoring for open water net-pen facilities, (reported at the end of the production cycle in BC) • 72 hour notification for pesticide deposits • Annual reporting of drug and pesticide deposits, including product, location and amount used (reported quarterly in BC) • AAR annual report for all sectors – open water net-pen, land-based and shellfish (due annually on April 1st) <p>Drug and pesticide use data are publicly reported on by DFO National Headquarters. Benthic data are publicly reported regionally.</p>
41	<p>Strategy 5: Annual Program Delivery</p> <p>Action Step 5.1: Assess the status of CUs and populations</p>	Assess the value of annual lake stock assessments and monitoring programs for fall fry populations in the Fraser Basin with the goal of	Science	31-Mar-19	Complete	<p>Since 2017, DFO's Lakes Research Program has continued to execute a resource-proportional response to the original recommendation of Justice Cohen (#33) to increase the number of juvenile Sockeye salmon surveys within the Fraser River watershed from two to four lakes. In 2021-22, juvenile Sockeye salmon abundance surveys were conducted in five salmon nursery lakes within the Fraser Basin (Fraser, Francois, Bowron, Chilliwack, and Cultus lakes).</p>

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		increasing work from two to four lakes annually				<p>The value of annual lake-based fish and aquatic ecosystem monitoring (hydroacoustic/trawl surveys, limnology surveys) and research is continually demonstrated by the direct inclusion of Lakes Research Program-generated data in Fraser River Sockeye salmon adult return forecasting, productive capacity modeling for the management of populations, fisheries, and species at risk, the identification and characterization of freshwater and associated watershed limiting factors and threats to Pacific salmon, and the continuance of foundational reference datasets spanning 40+ years, reflecting substantial environmental changes. Moreover, Science advice arising from these activities directly serves a broad array of internal and external clients/partners and Indigenous nations on an ongoing and ad hoc basis.</p> <p>DFO's Lakes Research Program is capable of deployment across the Pacific Region, and has developed a rotational framework of assessment for Fraser Sockeye salmon populations that can be scaled and implemented to service all CUs, providing core information to manage populations, natal habitats, and fisheries.</p>
42	<p>Strategy 5: Annual Program Delivery</p> <p>Action Step 5.2: Plan and conduct annual fisheries</p>	Work towards implementation of Fisheries Monitoring and Catch Reporting Framework to incorporate risk-based standards and monitoring of harvester-funded programs	Fisheries Management	Ongoing	Not Ongoing	<p>Following multi-sectoral consultations, DFO released the national Fishery Monitoring Policy in 2019, replacing the regional Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries (2012). The current implementation status of the national Fishery Monitoring Policy is reported online. Future fishery assessments will be completed under the national Fishery Monitoring Policy.</p> <p>Link: National Fishery Monitoring Policy</p> <p>Link: Sustainable Fisheries Framework Work Plan</p>
43	<p>Strategy 5: Annual Program Delivery</p> <p>Action Step 5.4: Plan and implement annual enhancement activities</p>	Develop explicit biological goals for hatchery-influence on populations	PSSI	1-Jun-20	Complete	<p>The CSAS paper "Genetically Based Targets for Enhanced Contributions to Canadian Pacific Chinook Salmon Populations" (Withler, et al 2018) contains biological goals for hatchery or hatchery-influenced Chinook salmon populations. Development of genetic management guidelines to translate CSAS input into DFO production planning and operations is underway.</p> <p>Link: Genetically Based Targets for Enhanced Contributions to Canadian Pacific Chinook Salmon Populations</p>

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44	Strategy 5: Annual Program Delivery Action Step 5.4: Plan and implement annual enhancement activities	Continue to implement transparent decision making framework for hatchery production in fishery planning processes that takes into account WSP objectives, balancing of risks of genetic effects, and the socio-economic benefits of increased stock abundance	PSSI	Jul-19	Complete	DFO's updated Production Planning Framework, used in conjunction with the Biological Risk Management Framework and other supporting guidance material, guides DFO salmon enhancement decisions. Link: SEP Production Planning: A Framework Link: A Biological Risk Management Framework for Enhancing Salmon in the Pacific Region
45	Strategy 5: Annual Program Delivery Action Step 5.4: Plan and implement annual enhancement activities	Implement annual enhancement programs that utilize emerging science on hatchery-wild interactions	PSSI	Ongoing	Complete	DFO's annual enhancement production planning incorporates current and emerging science, and does so transparently using publicly available frameworks and guidelines incorporating that are updated as new information becomes available. For example, DFO has implemented the use of hatchery genetic management guidelines advice established through CSAS, and revised DFO's production planning approach.
46	Strategy 6: Performance Review Action Step 6.2: Conduct regular reviews of the success of the WSP	Coordinate annual WSP implementation reporting, and publish annual report on the DFO website	Policy and Economic Analysis	Annually, April 30	Complete	Annual reports were completed and published for 2018-19, 2019-20, and 2020-21. This five-year review capture activity statuses and results from the 2021-22 fiscal year. Link: Wild Salmon Policy Implementation Plan Annual Report 2018-19 Link: Wild Salmon Policy Implementation Plan Annual Report 2019-20 Link: Wild Salmon Policy Implementation Plan Annual Report 2020-21
47	Strategy 6: Performance Review Action Step 6.2: Conduct regular reviews of the success of the WSP	Coordinate 5-year reporting and publish 5-year review report on the DFO website	Policy and Economic Analysis	April 30, 2022	Complete	Five-year report outlines results over the whole implementation plan time period.

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48	Strategy 6: Performance Review Additional strategy work	Coordinate the addition of activities into the WSP Implementation Plan based on renewed <i>Fisheries Act</i>	Policy and Economic Analysis	2020	Complete	Activities to incorporate provisions from the renewed <i>Fisheries Act</i> were added to the Implementation Plan in the Addendum to the WSP Implementation Plan in 2021. Six new activities were identified (activities 49-54). Link: Addendum to the Wild Salmon Policy Implementation Plan
49	Strategy 6: Performance Review Additional strategy work	DFO Pacific Science to provide advice on methodology to estimate Limit Reference Points for Salmon Stock Management Units comprised of one or more CUs	Science	31-Mar-22	Complete	CSAS Regional Peer Review was held in March 2022 and resulting publications are expected soon.
50	Strategy 6: Performance Review Additional strategy work	Translate the National Guidance on FSP Rebuilding Plans for application to Pacific Salmon in a manner consistent with the WSP	Science	31-Mar-22	Not Complete	National guidance is complete and regulations establishing the Schedule IX Major Fish stocks under the Fish Stocks Provisions were published in April 2022. The National guidance is based on one-stock, one-LRP. Work on stock management units has identified them as the appropriate scale for the application of the Fish Stocks Provisions and a March 2022 CSAS process has provided guidance on the methodology to establish a limit reference point for stock management units. Internal cross-branch/sectoral discussions are underway to foster a shared understanding of roles and responsibilities. Additional meetings will occur through 2022 to transfer the National guidance to SMUs of Pacific salmon and provide guidance on the scale of planning for harvest, hatcheries, and habitat (e.g., watershed, ecosystem, etc.). Link: Regulations Amending the Fishery (General) Regulations SOR/2022-73 Link: Science Guidelines to Support Development of Rebuilding Plans for Canadian Fish Stocks
51	Strategy 6: Performance Review Additional strategy work	Coordinate implementation of Fish Stocks provisions for prescribed stocks of Pacific salmon	Fisheries Management	Ongoing*	Ongoing	WCVI Chinook, Okanagan Chinook, and Interior Fraser Coho have been listed as Major Fish Stocks under Schedule IV of the <i>Fisheries Act</i> Fish Stock Provisions. Work is ongoing to determine if these stocks are below their Limit Reference Point; if they are found to be, Rebuilding Plans under the Fish Stocks Provisions will be required.

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52	Strategy 6: Performance Review Additional strategy work	Study Coho salmon habitat use, productivity, and response to land use change in the North Thompson watershed	Science	Ongoing*	Ongoing	Coho salmon habitat use, productivity and responses to land use are ongoing research activities. A large scale field program was initiated in 2019 to address knowledge gaps in the research areas and a fourth field season is planned for 2022-23. The first step in this work, a paper focused on forestry impacts on small coho streams in the North Thompson will be completed by the end of June.
53	Strategy 6: Performance Review Additional strategy work	Engagement with external partners and stakeholders on Cumulative Effects, Habitat Offsetting and Banking, Prescribed Works and Waters Regulations, <i>Fisheries Act</i> Registry, Codes of Practice and Engagement Framework	Ecosystem Management	Ongoing	Ongoing	Through strategic planning using the best available data, FFHPP will continue to work toward recovery of salmon by engaging with partners to identify and act on priority protection and restoration activities. This will further DFO's ability to address threats to CUs through data sharing and co-development of spatial GIS tools. Partnerships are also being leveraged to begin planning for salmon recovery and protection at both the watershed and sub-regional scales. Link: Let's Talk Fish Habitat
54	Strategy 6: Performance Review Additional strategy work	Review and update the WSP Implementation Plan to ensure consistency of definitions with the renewed <i>Fisheries Act</i>	Policy and Economic Analysis	Ongoing*	Ongoing	Implementation of the WSP will continue beyond the end of the plan time frame, and will be aligned with both the renewed <i>Fisheries Act</i> , and initiatives under the PSSI.

*Activity was described in the Implementation Plan as having a Target Complete Date, but has been revised as Ongoing to more accurately reflect the continuing nature of the work.