

DRAFT 2018-2022 Wild Salmon Policy Implementation Plan – For Consultations

Initial Draft for Fall 2017 Consultations - This initial draft document is being shared for the purposes of fostering an open and transparent dialogue throughout Fall 2017 on the further development of the Wild Salmon Policy Five Year Implementation Plan (2018-2022).



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Thank you for your interest in the *Draft 2018-2022 Wild Salmon Policy Implementation Plan – For Consultations*. We are pleased to share a copy of this draft plan for your feedback and are looking forward to having thoughtful discussions during the months ahead as we work to finalize this plan.

As you know, since 2005, Fisheries and Oceans Canada (DFO) has used *Canada's Policy for Conservation of Wild Pacific Salmon* (commonly referred to as the *Wild Salmon Policy* or WSP) to guide wild Pacific Salmon-related work on a day-to-day basis. At the same time, First Nations, provincial and territorial partners, and stakeholders have also undertaken important work that supports the goal and objectives of the WSP. We know that there is an appetite for a detailed plan beyond the action steps listed in the WSP, and following a series of broad engagement sessions between October 2016 and March 2017, DFO received advice and information from First Nations, partners, and stakeholders to develop this initial draft.

This draft implementation plan outlines DFO's planned work over the next five years—from 2018-2022—that supports Pacific wild salmon and salmon habitat conservation across BC and Yukon. It also highlights some of the many ongoing contributions other groups make in support of Pacific wild salmon. But it remains a work in progress, and throughout fall 2017 we hope to get your feedback on the document at one of our consultation sessions or electronically at WildSalmonPolicy@dfo-mpo.gc.ca. As you read through the draft plan, keep an eye out for elements you think could use more elaboration, or where things might not be as clear or accurate as they could be. Think about projects you know about or are involved in that are planned for 2018-2022 that will add to the planned activities already included.

DFO recognizes that achieving the goal of the WSP requires collaborating with others and the goal of having a robust implementation plan is no different. With your support we can build an even stronger implementation plan with the ultimate goal of restoring and maintaining healthy Pacific salmon populations for generations to come. Thank you and I look forward to the opportunity for further discussion through the fall consultation sessions. For more information on the fall consultations please visit <http://www.pac.dfo-mpo.gc.ca/consultation/wsp-pss/index-eng.html>.

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Preface

When *Canada's Policy for Conservation of Wild Pacific Salmon* (Wild Salmon Policy, or WSP) was released in 2005, it captured attention at home and abroad. This groundbreaking document put a new priority on conserving the rich biological diversity of Pacific salmon. At the same time, the policy was explicit about the implementation challenge that lay ahead.

Since then, Fisheries and Oceans Canada (DFO) has worked steadily to implement the WSP, but acknowledges that progress has been challenged by the scale of effort needed to define biological units of salmon diversity and assess their health status. Independent reviews and consultations, including the 2011 Gardner Pinfold Review and 2012 *Commission of Inquiry into the Decline of Sockeye Salmon in the Fraser River* (Cohen Commission), reported that a detailed implementation plan was needed.

So now, twelve years on, where does the policy stand? Above all, DFO and its partners across British Columbia and the Yukon remain firmly committed to its goal, principles, objectives, and strategies. Indeed, the concerns for Pacific salmon on which the policy was founded may be even stronger today, as climate change adds to the threats being faced by wild salmon.

This five-year Implementation Plan (Plan) describes the set of concrete activities to be undertaken within the Department's resources to meet the goal of the WSP. However, DFO cannot meet the goals of the WSP without the input and work of others, and so this plan also reflects the contributions and successes of Indigenous people, communities, watershed groups, and the many other organizations dedicated to salmon and habitat conservation. It is vital to recognize the aspirations of those who value Pacific salmon and have a long history and knowledge of stewardship, and this plan documents some of the individual successes of partners in salmon conservation.

The conservation of wild salmon is a long-term endeavour, and the WSP guides many important ongoing projects that contribute to achieving its goal. This Plan will focus collective effort on developing tools and processes for continued implementation of the WSP. Progress on activities will be reviewed annually, with a full review of this Plan at the end of the five-year period.

The political and regulatory landscape in which the WSP operates is constantly evolving, and this Implementation Plan must be able to adapt to changes when they arise. DFO is committed to reviewing the Plan as any new programs and policies related to the *Fisheries Act* are announced.

DFO has listened to the comments and recommendations from the review processes and ongoing consultations. The Department now looks forward to working with partners to put this 2018-2022 Implementation Plan into action.

1. Introduction

Wild Pacific salmon are iconic in British Columbia and the Yukon. They hold tremendous value for natural ecosystems, Indigenous people, coastal communities, and the fishing industry. More broadly, their journey home to streams and rivers is a symbol of struggle, renewal, and adaptation for all who live along the Coast and inland watersheds of the Pacific Region.

Pacific salmon have diverse, complex life histories that take them from freshwater hatching to rearing in streams, rivers, lakes, and estuaries, to ocean feeding and growth covering up to thousands of kilometres, and home to fresh water for spawning. Over the course of their migrations, they endure wide-ranging environmental pressures, both natural and human-made, and come under the influence of multiple regulatory authorities. This, in turn, makes salmon and salmon habitat management highly complex and uncertain.

1.1.2005 Wild Salmon Policy

The Wild Salmon Policy was released in 2005, following more than six years of drafting and consultation. It marked a major turning point in the management of Pacific salmon by articulating a conservation ethic to preserve genetic diversity as well as salmon abundance. In particular, this transformative policy introduced the idea of “Conservation Units” (CUs), or aggregates of salmon populations that must be managed for diversity. Overall, the WSP envisions a future of healthy wild salmon populations, sustainable fisheries, and attention to ecosystem values in salmon and habitat management decisions.

Conservation Units (CUs) are groups of wild salmon sufficiently isolated from other groups that, if extirpated, they are very unlikely to recolonize naturally within an acceptable timeframe, such as a human lifetime or a specified number of salmon generations.

1.1.1. The Policy Framework

The WSP established a policy framework of an overarching goal for wild salmon, some guiding principles, and objectives, strategies, and action steps to achieve the goal. The ultimate goal 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 (DFO 2005, p. 9).”

The guiding principles for salmon-related decisions and activities are:

- Principle 1: **Conservation** of wild salmon and their habitats as the highest priority in resource management decision-making.
- Principle 2: **Honouring obligations to First Nations** in resource management decisions.
- Principle 3: **Sustainable use** by considering biological, social, and economic consequences, reflecting best science including Aboriginal Traditional Knowledge (ATK), and maintaining the potential for future generations to meet their needs and aspirations.

Aboriginal Traditional Knowledge (ATK) is a collection of knowledge, practices, and beliefs unique to Indigenous people and passed down through generations.

- Principle 4: **Open process** for decision-making that is transparent and inclusive.

The objectives to achieve the policy goal for wild salmon are to:

1. Safeguard the genetic diversity of wild Pacific salmon;
2. Maintain habitat and ecosystem integrity; and
3. Manage fisheries for sustainable benefits.

(The strategies to implement the WSP are outlined in Section 3.2.)

1.1.2. WSP Implementation

The WSP committed to the development of an implementation plan within DFO's existing resource capability and phased in over time. It recognized that the full-scale delivery of conducting the scientific work on identifying and assessing CUs and adapting the Department's operational programs and activities, would take substantial time and resources. The WSP also acknowledged that successful implementation would depend on forming improved partnerships with Indigenous people, other governments, volunteers, and stakeholders.

1.2. Wild Salmon Since 2005

The WSP was motivated by a convergence of forces. Pacific salmon abundance had fallen sharply during the 1990s, with fishing, low ocean productivity, and deteriorating freshwater habitat contributing to the decline. DFO's policies had shifted towards an emphasis on conservation, sustainable use, and the adoption of the precautionary approach in decision-making. Canada had recognized its obligations to protect biodiversity and Aboriginal fishery rights. At the same time, there was a new scientific understanding of the importance of biodiversity within wild salmon populations.

The **Precautionary approach** is about being cautious when scientific knowledge is uncertain, and not using the absence of scientific information as a reason to postpone or fail to take action to avoid serious harm to fish stocks or their ecosystem.

1.3. Pressures on Salmon and Habitat

Wild salmon complete their life history over a range of freshwater and marine habitats, such as rivers, lakes, nearshore coastal areas and open ocean. The amount of space occupied and time spent in each of the habitats varies by the different salmon CUs. By consequence, there are differences in the level of impact to CUs from natural and human-induced changes to these habitats (e.g., drought, flood, forest cover removal, climate change). Furthermore, salmon CUs face cumulative impacts across the range of habitats throughout their life history.

1.4. Importance of Wild Salmon

An enduring impetus for the WSP is the important ecological, cultural, and socio-economic value of wild Pacific salmon. Salmon are a keystone species in marine, freshwater, and terrestrial ecosystems. Many species of fauna and flora—from orcas to black bears to Douglas fir—depend on migrating salmon, as returning adults carry rich ocean nutrients back to spawning grounds.

Salmon also serve as an indicator species for demonstrating the cumulative impacts of environmental pressures across freshwater and marine habitats.

For Indigenous people, salmon hold a special place not only as a traditional subsistence food, but also as a vital component in ceremonies and social relationships. First Nations communities are inextricably bound to wild salmon and aquatic ecosystems as salmon contribute to their nutritional, spiritual, cultural, social, and economic wellbeing.

Wild salmon also support commercial and recreational fisheries that are part of the socio-economic fabric of the Pacific Region. The business spin-offs from this fishing activity—in fish processing, guides, tackle shops, hotels, ecotourism, restaurants, etc.—ripple through the economy, creating jobs and income.

Climate Change in the Yukon: A Case Study

Perhaps nowhere in the Pacific Region are the impacts of climate change on salmon, their environments, and communities more likely to be observed than in Yukon. The melting of permafrost has drained lakes and caused landslides, releasing sediments into rivers and streams. In the spring of 2016, the retreat of the Kaskawulsh Glacier caused a “river piracy” event that sent water normally flowing north to the Bering Sea flowing south to the Gulf of Alaska and the Pacific Ocean.

At more than 3,000 kilometres, the Yukon River is home to the world’s longest Chinook salmon migration. Since 2000, Chinook experienced a sustained decline in abundance to approximately 50% of historical levels. A combination of factors is likely contributing to this long-term change. Declines in marine survival rates, climate variability, and changes to species distribution (leading to potentially increased competition or predation) influence nearly all life stages, making it increasingly difficult to accurately predict recruitment and abundance.

Yukon First Nations have experienced the effects of climate change on their reliance on salmon for subsistence (food) and cultural practices. Yukon River Chinook salmon have not been consistently available for the fish camps that serve to pass on teachings and social values, in the tradition of spiritual laws known as the “Doòli”. Bears, a significant salmon predator that would otherwise rely on this essential seasonally-available food source, have been forced to seek alternative prey items – which has led to increased human wildlife conflicts in a number of Yukon communities.

1.5.External Reviews and Consultations

Two external reviews of the Wild Salmon Policy’s status and an initial round of DFO consultations have provided useful guidance on the development of an implementation plan: the Gardner Pinfold review (conducted as part of the commitment in the policy to review it after five years) and the *Commission of Inquiry into the Decline of Sockeye Salmon in the Fraser River* (Cohen Commission). Both of these reports recommended a detailed implementation plan and public reporting of results.

“Canada must complete the implementation of the Wild Salmon Policy. To do so effectively, DFO must develop a concrete plan for what needs to be done ...”

Cohen (2012), p. 539.

1.5.1 Preliminary Consultations

As a first step in engaging Indigenous peoples, stakeholders, and the public in the development of a draft plan, a series of meetings and public open house sessions took place in late 2016 in Kamloops, Prince George, Prince Rupert, Nanaimo, and Vancouver, BC. In February 2017,

consultation sessions were held with First Nations and territorial governments and advisory agencies in Whitehorse, Yukon.

These consultations revealed strong support for the WSP and agreement that the policy framework (goal, objectives, etc.) remains relevant and useful today. Concerns were expressed about the pace of implementation and the combined effect of funding constraints, changes to the *Fisheries Act*, and cuts to DFO Habitat staff on implementation capacity. Additional comments included:

- The WSP Implementation Plan must recognize that access to salmon is integral to the identity, wellbeing, livelihoods, culture, society, and economy of Indigenous people.
- Conservation and rebuilding of salmon stocks should be the first priority.
- There needs to be more focus on habitat protection, as most of the focus of WSP implementation to date has been on fisheries management.
- There should be clear outcomes at the end of the five-year Implementation Plan.

These comments and the many others made during these sessions were the foundation for this Plan.

2. Context of Wild Salmon Policy Implementation Plan

2.1. Purpose of Implementation Plan

The purpose of this Plan is to set out the activities that will be undertaken over the next five years to advance the goal and objectives of the Wild Salmon Policy. These activities reflect what is achievable given existing resources for the 2018-22 period and will be used to measure progress on implementing the WSP. Many activities are ongoing and will extend into the next phase of implementation. This five-year Plan lays the groundwork for continued implementation of the Policy towards its long-term goal.

2.2. The Collaborative Approach / Effective Partnerships

Across BC and Yukon, Indigenous peoples, government agencies, stewardship and fishing organizations and communities share a commitment to conserve wild salmon, their habitats, and ecosystems. Indigenous peoples, stewardship organizations, and community volunteers already undertake important work to assess stock status, monitor and report catches, and protect and restore habitat. There are opportunities to build on and share the work associated with conservation of wild Pacific salmon, and to better leverage and coordinate resources.

For collaboration to work, data standards, common methodologies, and best practices will be important for consistent implementation of WSP activities by DFO and partners alike. Therefore, one of the key focuses for work over this five-year period will be to identify where existing tools and practices can be expanded for broader application.

Applying the collaborative approach includes the development of this Plan with Indigenous people, government partners, and stakeholder groups. Through a series of meetings with First Nations and public open houses from November 2016 – February 2017, participants from across BC and the Yukon shared their ideas and perspectives on what is needed for WSP implementation. They also shared examples of the work they are doing that contributes to the WSP goals and objectives. A working group with participants from the First Nations Salmon Coordinating Committee (SCC), Province of BC (BC), Yukon Salmon Sub-Committee (YSSC), Pacific Salmon Foundation (PSF) and DFO reviewed the contributions and developed this first draft of the Plan. The feedback and contributions that are gathered through the current phase of consultations will further inform a final draft of this Plan.

2.3. Governance for Wild Salmon

2.3.1. Federal Government

Canada exercises exclusive legislative jurisdiction over “sea Coast and inland Fisheries,” which includes Pacific salmon, pursuant to s. 91(12) of the *Constitution Act, 1867*. Canada’s jurisdiction over sea coast and inland fisheries is given effect primarily through the *Fisheries Act* and related regulations. In addition to legislation and regulations, DFO is guided by a wide range of policy and programs and international commitments related to Pacific salmon, such as those under the Pacific Salmon Treaty, which commits Canada and the U.S. to work together on research, conservation and management of Pacific salmon. As well, the provincial and territorial governments, BC and Yukon First Nations, and local and regional governments have legal

authority and rights with respect to land and resource management that impacts wild salmon, their habitats, and ecosystems.

While the Wild Salmon Policy itself has not changed since 2005, there have been legal, regulatory, and policy developments that should be considered in its implementation. The WSP is one element of a multi-jurisdictional governance framework that guides and shapes the management of Pacific salmon and their habitats. This five-year Plan takes into account changes in the policy and regulatory environment that have occurred since the WSP's release. It is expected to evolve as other changes are made over the 2018-2022 period.

What Partners are Doing: Regulation Example

Placeholder for examples of federal partners in fish and habitat protection – e.g., COSEWIC, Environment Canada hydrometric program and freshwater quality monitoring, or other example?

DFO is responsible for the protection of fish and fish habitat under sections 35 through 37 of the federal *Fisheries Act*. The Department's management responsibilities include salmon allocation (conservation and use), stock assessment, and habitat restoration and protection. Other federal legislation, such as the *Species at Risk Act*, *Oceans Act*, and *Canadian Environmental Assessment Act*, and the *Yukon Environmental and Socio-Economic Assessment Act*, provide direction on related matters, e.g., aquatic species at risk, ecosystem-based resource management, and environmental reviews of development projects.

Policy Basis for the WSP

Since the mid-1990s, a policy framework has evolved to support well-managed and sustainable Pacific salmon fisheries. The 2005 WSP was grounded in *A New Direction for Canada's Pacific Salmon Fisheries* (1998) and its operational policies: *An Allocation Policy for Pacific Salmon* (1999), *A Framework for Improved Decision Making in the Pacific Salmon Fishery* (2000), and *A Policy for Selective Fishing in Canada's Pacific Fisheries* (2001). This framework set out the principles of conservation as the first priority for managing wild salmon, sustainable resource use, and an increased role for fishery interests in decision-making.

Selective fishing is a conservation-based management approach that allows for the harvest of surplus target species while aiming to minimize or avoid the harvest of species or stocks of concern, or to release bycatch unharmed.

Review of Changes to the *Fisheries Act*

Amendments to the *Fisheries Act* were made in 2012 through Bill C-38, the *Jobs Growth and Long-Term Prosperity Act* and Bill C-45, the *Jobs and Growth Act*. Although some amendments to the *Fisheries Act* came into force upon Royal Assent of Bill C-38, final amendments from both bills came into force on November 25, 2013. One of the most notable changes to the Act in 2012 was the focusing of its protections on the productivity of fish that are part of a commercial, recreational or Aboriginal (CRA) fishery. Under the new Act, sections 32 and 35 were merged into a single new prohibition in section 35(1) against carrying on "any work, undertaking or activity that results in serious harm to fish that are part of or support a commercial, recreational, or Aboriginal fishery." In addition, the Fisheries Protection Program (FPP) was formed for the

administration of the new fisheries protection provisions of the *Fisheries Act*, replacing the Habitat Management Program.

On November 13, 2015, the Prime Minister mandated the Minister of Fisheries, Oceans and the Canadian Coast Guard to review the previous government's changes to the *Fisheries Act*, restore lost protections and incorporate modern safeguards. The Parliamentary Standing Committee on Fisheries & Oceans (the Standing Committee) was asked to examine the 2012 changes to the *Fisheries Act* and to hear from Canadians. In the fall of 2016, DFO began consultations with Indigenous peoples, provincial and territorial partners, and the public at large to engage and hear from Canadians on the review the 2012 changes to the *Fisheries Act*. The Standing Committee's review and DFO's engagement with Canadians strongly supported restoring the lost protections in the Act, and modernizing safeguards to reflect the evolving nature of fish and habitat management.

All of the recommendations from the Standing Committee's review were supported by the Government in its June 2017 response. Moving forward, the Government intends to consider legislative, policy, and program changes to address the Committee's recommendations to restore lost protections and incorporate modern safeguards.

Any potential amendments to the Fisheries Act, and related policy and program amendments that occur as a result will be assessed and incorporated into this Plan, as appropriate.

Other Policy and Regulatory Developments Affecting WSP Governance

The WSP was part of the Pacific Fisheries Reform launched in 2005 to address the challenges facing the salmon fishery, especially on the Fraser River. Key themes of this initiative were to sustain strong salmon populations, increase Indigenous peoples' access to fishing opportunities, and improve the economic performance of fisheries. Since then, a number of other policies and regulatory changes have continued the reform process and supported WSP principles, including:

Integrated Aboriginal Policy Framework (2006–) – This framework was created to guide DFO staff on the renewal of Aboriginal policies and programs, and on the need for respectful relationships with Indigenous people who seek a greater share of the fisheries resource and a larger role in resource management. It set out a number of strategies, such as building Aboriginal capacity, increased participation in the commercial fishery, and support for co-management of aquatic resources.

Terminal fisheries are those that occur near or in fresh water (e.g., at a river's mouth) where the targeted species or stock has returned to spawn.

Pacific Integrated Commercial Fisheries Initiative, PICFI (2007–) – The goal of this initiative is to pursue sustainable commercial fisheries with First Nations involvement, while maintaining conservation as a priority. In addition to supporting the establishment of 25 Aboriginal Commercial Fishing Enterprises, PICFI has led to the development of a fishery monitoring and catch reporting framework, collaborative management processes (e.g., the SCC), and demonstrations of terminal in-river fisheries for First Nation communities.

Sustainable Fisheries Framework, SFF (2009) – The SFF is a suite of policies aimed at ensuring that fisheries management upholds conservation and sustainable use, and supports economic prosperity in the fishing industry. It serves as the foundation for an ecosystem-based, precautionary approach to fisheries management. Component policies include a fishery decision-making framework, a *Policy on Managing Bycatch* (2013), and *Guidance for the Development of Rebuilding Plans* (2013).

What Partners are Doing: Selective Fishing Examples

BC First Nations have been demonstrating terminal, in-river selective fisheries that help protect salmon diversity and promote sustainable use. The combination of terminal fisheries and selective gear means that the pressure on weaker stocks is reduced relative to traditional mixed-stock fisheries in the marine environment.

Placeholder for additional examples

Fishery Decision-Making Framework (2009) – *The Fishery Decision-Making Framework Incorporating the Precautionary Approach* applies to key DFO-managed fish stocks that are targeted in a commercial, recreational, or subsistence fishery. Fisheries management plans must include a harvest strategy to keep the removal rate moderate when the stock status is healthy, to promote rebuilding when the status is low, and to ensure a low risk of serious or irreversible harm to the stock. A rebuilding plan is required when the stock reaches a critical level.

Pacific Aquaculture Regulations (2010) – The Department has assumed primary responsibility for the management and regulation of BC aquaculture. Regulations were adopted under the *Fisheries Act* to ensure that the aquaculture industry operates in a sustainable manner. These include requirements for the treatment of fish for disease and parasites, deposition of organic matter, environmental monitoring, and public reporting. DFO fishery officers and fish health staff, who are designated fishery guardians, have the authority under section 49 of the *Fisheries Act* to collect fish samples from salmon farms during facility inspections and audits. In addition to samples provided by industry, DFO fish health staff collects their own samples to maintain integrity of the specimen for research and audits. DFO also participates in research projects, such as the Strategic Salmon Health Initiative, where samples are collected under agreements with farm operators.

Fisheries Monitoring and Catch Reporting (2012) – Fishery managers and harvesters are working on monitoring and catch reporting programs to better balance conservation, ecosystem, socio-economic, and other management objectives. The *Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries* outlines the use of consistent risk assessment criteria to determine the level of monitoring required, while recognizing that monitoring and catch reporting programs will be fishery-specific.

2.3.2. First Nation Governance

The relationship between salmon and Indigenous people goes back far before Confederation and Indigenous people today fish for salmon in some of the same places their ancestors fished since time immemorial. Salmon are not only a food source for Indigenous people; they are also culturally significant and play an important role in many ceremonies.

Although aboriginal rights and title have existed since time immemorial, they were only entrenched in the *Constitution Act* in 1982. Consecutive Supreme Court of Canada (Supreme Court) rulings, including Haida Nation and Taku River Tlingit, have affirmed the Crown's obligation to consult and accommodate Aboriginal groups before undertaking an action that could infringe upon these constitutional rights. Modern final treaty agreements and reconciliation agreements with Indigenous groups in the Pacific Region provide further mechanisms for articulating fishing rights and the role of First Nations in resource management.

The Government of Canada is committed to working with Indigenous peoples to chart a path forward to recognition-based relationships. At the core of the Government's recent release of ten *Principles Respecting Canada's Relationship with Indigenous Peoples* (the Principles) is the recognition of Indigenous peoples, government and laws and their relationship to lands and resources. The Principles are rooted in Section 35 (1) of the Canadian Constitution and the United Nations Declaration on the Rights of Indigenous Peoples, 2007, and were informed by the Truth and Reconciliation Commission's Calls to Action and the report of the Royal Commission on Aboriginal Peoples. The Principles give life to a new and transformed era in Indigenous-Crown relations, and guide the Government of Canada's work with Indigenous peoples.

Aboriginal rights are practices, customs, and traditions that distinguish the unique culture of each Aboriginal group.

Treaty rights are Aboriginal rights set out in a treaty and constitutionally protected.

Aboriginal title is the right of Aboriginal groups to use their traditional lands and waters.

"Indigenous rights, treaties, and the government to government relationship must be recognized in an updated WSP and implementation plan, as a number of court cases and modern treaties have been concluded since 2005."

Comment from the 2016/17
WSP Consultations

BC First Nations

BC is unique among provinces and territories in its large number of First Nations without treaties. In addition to the Nisaga'a Final Agreement which took effect in 2000, three other final agreements are now in place: the Tsawwassen First Nation Final Agreement (2009), the Maa-nulth Nations Final Agreement (2011), and the Tla'amin Final Agreement (2016). The WSP will be implemented consistent with these agreements and any others that are finalized between the federal government and First Nations over the period of this Implementation Plan.

In 2006, a *BC First Nations Fisheries Action Plan* was endorsed by the BC Assembly of First Nations, Union of BC Indian Chiefs, and First Nations Summit (FNFC 2007). This Plan serves as the foundation for First Nations to seek greater participation in the BC fishery and fisheries decision-making. It has common principles with the WSP, including the priority on conservation

of aquatic resources, respect for ATK, and shared responsibility for resource management among First Nations and the federal and provincial governments.

The Action Plan led to the creation of the First Nations Fisheries Council (FNFC), with members from across BC. The Council works to implement the plan and provide a united voice in support of aboriginal rights and title, treaty rights, and the diverse fishery interests of its members. There is a multi-level approach to First Nations engagement in fisheries decision-making: First Nations only (Tier 1), First Nations and government (Tier 2), and First Nations, government, and stakeholders (Tier 3).

Yukon First Nations

In 1993, Yukon First Nations and the federal and territorial governments signed the Umbrella Final Agreement (UFA), which provided a framework for negotiations for subsequent final agreements between individual Yukon First Nations and the federal and territorial governments. Since 1993, 11 First Nation Final Agreements (FNFAs) have been signed in the Yukon. Under the FNFAs, individual First Nations have responsibility for managing fish and wildlife on Settlement Lands, including provisions for the basic needs allocation for salmon. Yukon First Nations have made substantial progress in improving their capacity for resource management over the past two decades. They are at different stages of developing and updating salmon management plans for their territories, as FNFAs are implemented.

Yukon First Nations have expressed particular concern over the long-term decline in Chinook salmon stocks along the Yukon River. Not only has run abundance declined well below the historical average, but there has also been a reduction in the individual size and age of fish and the proportion of females represented in the population. Consistent with the WSP, Yukon First Nations have adopted targeted management approaches, such as Council resolutions and community-based management plans that meet similar conservation objectives (see further under Section 5.2).

2.3.3. BC Government

The Province of BC has jurisdiction over Crown lands, which includes the foreshore, beds of rivers, streams and lakes, and bounded coastal water. As a result, wild salmon and their habitats are directly impacted by provincial decisions on land use and resource development activities, such as forestry, mining, dam construction, agriculture, and highway and pipeline development.

In recognition of this, the province has put in place many tools to ensure that fish habitat is protected and maintained during provincially regulated activities, including specific policies in response to Cohen Commission recommendations. The province also carries out the duty to consult First Nations on provincial decisions that could affect salmon habitat and associated Aboriginal Interests.

Key provincial tools for protecting fish habitat include the *Forest and Range Practices Act* (FRPA) and supporting regulations that replace the *Forest Practices Code*; the *Oil and Gas Activities Act* (OGGA); the *Fish Protection Act* since replaced by provisions in the *Water Sustainability Act* (WSA); and the *Riparian Areas Protection Act*; and the *Water Act* and regulations since replaced by the WSA.

Forest and Range Practices Act, FRPA (2002) and *Oil and Gas Activities Act, OGAA* (2008) provide equivalent regulatory direction for fish habitat protection. They both require protection of riparian habitat through required riparian setbacks. Fisheries Sensitive Watersheds provide direction for managing cumulative hydrologic impacts in streams that have significant and sensitive fisheries values. Both regimes require the provision of safe fish passage at stream crossings, and road building practices to manage for sediment input to fish habitat. Wildlife Habitat Areas allow for the protection of the habitat of fish that are at risk.

Water Sustainability Act, WSA (2016) – The WSA replaced the old *Water Act*, enabling a suite of tools to better protect BC’s fresh water. In terms of the WSP, the Act allows the Province to issue temporary orders that prioritize minimum stream flows for fish and ecosystem values during water shortages. It enables the creation of “Water Sustainability Plans” to address water use conflicts and protect ecosystem health. The WSA also allows for the setting of “Water Objectives,” so that land and resource users will consider criteria to sustain water quantity, water quality, and aquatic ecosystems in their decision-making.

Riparian Areas Regulation, RAR (2006) – Replacing the former *Streamside Protection Regulation*, the RAR, which was enacted under the *Fish Protection Act* (subsequently re-titled the *Riparian Areas Protection Act*), is designed to complement the *Fisheries Act* approval process for developments in and around fish habitat. Under the RAR, local governments are directed to pass bylaws requiring residential, commercial, and industrial developments to conduct a science-based riparian area assessment by a Qualified Environmental Professional (QEP). As long as the QEP follows the assessment methods and the development meets any protection measures identified, a potential *Fisheries Act* violation will be avoided.

A Provincial Framework for Steelhead Management in British Columbia St (2016) – A provincial Steelhead Management Framework was developed to protect freshwater fish habitat and ensure a sustainable recreational steelhead fishery. The policy affirms that, because salmon and steelhead are harvested in mixed stock fisheries with significant bycatch, the provincial and federal governments must work together to balance conservation, ecosystem, socio-economic, and other management objectives across species.

“Steelhead are salmonids but are not included in the WSP. They are key to groups in the interior of BC, and are considered in the overall management approach related to salmon returning up the Fraser.”

Comment from the 2016/17
WSP Consultations

Fish and Seafood Act, FSA (2017) – The new FSA is meant to modernize the licensing and regulation of fish and seafood products. It introduced new licences, reporting and training requirements, inspection powers, and penalties to protect food safety and monitor industry performance. For the WSP, the Act promotes sustainable use and benefit by ensuring that BC salmon is responsibly harvested and processed, and can be traced from commercial fishers to consumers.

2.3.4. Yukon Government and Advisory Bodies

The socio-political landscape of the Yukon changed dramatically in 1993, when First Nations and the federal and territorial governments signed the UFA and subsequent individual First

Nations Final Agreements. These agreements provide for First Nation land ownership and self-determination, and set up a structure for community-based resource management.

Chapter 16 of the UFA recognizes the need to ensure the equal participation of Yukon First Nations and other residents in fish and wildlife management processes and decisions. It established new bodies with management responsibilities for salmon and their habitat, which are also cited in 11 of the Yukon First Nation Final Agreements:

Yukon Fish and Wildlife Management Board (YFWMB) – This public advisory board serves as the main instrument for fish and wildlife management in the Yukon. It makes recommendations to the Yukon Minister of Environment, First Nations, and the Renewable Resources Councils on all matters related to fish and wildlife management, legislation, research, policies, and programs. The YFWMB is composed of six members nominated by First Nations and six members nominated by the territorial government.

Yukon Salmon Sub-Committee (YSSC) – The YSSC is a sub-committee of the YFWMB that advises on salmon management. It makes recommendations directly to the federal Minister of Fisheries and Oceans and to First Nations on any matter concerning salmon and their habitat, including allocation. The YSSC consists of two YFWMB members (one being a First Nations representative) and two members nominated by the Minister.

Renewable Resources Councils – These ten advisory councils are the primary mechanism for renewable resource management in Yukon First Nations' traditional territories. They make recommendations to the particular First Nation, YFWMB, and YSSC on issues related to the conservation of fish and wildlife, including harvesting requirements, salmon management plans, and commercial and other uses of salmon.

While the final authority for salmon and habitat management decisions reside with the Minister of Fisheries and Oceans (i.e., DFO), the recommendations from these advisory bodies must be fully considered and documented in an open and transparent public process.

Salmon allocation in the Yukon gives first priority, after conservation, to the basic needs of First Nations in a particular drainage basin, as set out in their final agreements. If the total allowable catch (TAC) is less than the basic needs level, then the TAC is distributed among the affected First Nations in proportion to its share of the total basic needs allocation. If the TAC exceeds the basic needs level, then commercial fishing licences are allocated to First Nations.

The work of the YSSC and Councils, as well as First Nations management plans aligns closely with WSP principles and objectives. The YSSC advises on managing fisheries to ensure conservation, sustainable use, and the restoration of depleted stocks. Under the UFA, traditional knowledge and scientific information are to be integrated for achieving conservation objectives.

With the devolution of federal powers in 2003, the Yukon government assumed control over land, water, mineral, and forest resource management for most of the territory. This includes a

The **basic needs level** is the total number of harvestable salmon of a particular species negotiated in a Yukon First Nations Agreement as a harvest allocation to the First Nation in its Traditional Territory.

Total Allowable Catch (TAC) in the Yukon means the number of salmon of a particular species in a given drainage basin that return to Canadian waters and are deemed not necessary for conservation.

variety of activities affecting salmon habitat, such as placer mining, farming, road construction, and oil and gas activity. The UFA also created the Yukon Land Use Planning Council and ten commissions to develop regional land use plans.

2.3.5. Local Governments

BC municipalities and regional districts also have a role in protecting salmon and salmon habitat through their authority for land use planning and management under Part 14 of the *Local Government Act*. Therefore, local governments have primary responsibility for fish habitat protection on private land. Further, section 12 of the provincial *Riparian Areas Protection Act* requires these local authorities to use their zoning bylaws, development permits, or other land use management tools to implement riparian area protection provisions.

Other local tools for conserving and protecting salmon habitat include information and educational programs about stream stewardship, watershed and storm water management plans, parkland acquisition, and landowner agreements.

2.3.6. International Agreements

The WSP was developed in the context of a number of key international agreements, including the *Pacific Salmon Treaty* (1985), *UN Convention on Biological Diversity* (1992), and *Pacific Salmon Agreement* (1999). Since then, there have been two major developments under the auspices of the Pacific Salmon Treaty (PST) and its joint administering body (the Pacific Salmon Commission), which provide the framework for Canada/US cooperation on salmon conservation and fisheries management:

Yukon River Salmon Agreement (2002) – The 1985 PST included a commitment by Canada and the US to carry on further negotiations about Yukon River salmon. Although a temporary agreement was in place for several years (1995-97), a final agreement was not reached until 2001. The Yukon River Salmon Agreement, which forms Chapter 8 of the treaty, sets out a distinct management regime for Yukon River salmon that adheres to the PST's broad science-based management principles. Administration of the agreement is assigned to the Yukon River Panel composed of Canadian and US representatives.

PST Conservation and Sustainability Revisions (2009) – In 2007, the Pacific Salmon Commission began reviewing five chapters of the treaty that were due to expire at the end of 2008. Following extensive consultations and negotiations, a new bilateral agreement was reached for the conservation and harvest sharing of Pacific salmon. The agreement represents a major step forward in science-based conservation and sustainable harvest allocation between the two countries. The revised fishing regimes for 2009 through 2018 are contained in Chapters 1-6 of Annex IV of the treaty.

The re-negotiation of expiring PST fishing chapters is underway and anticipated to continue throughout 2017. The objective is to achieve agreement on all relevant Chapters and their ratification before they expire at the end of 2018. Consultations and engagement with First Nations and stakeholders will continue to be an integral part of PST renewal

3. Overview of the Implementation Plan

3.1 Plan Scope

The 2005 WSP laid out a general approach for maintaining and restoring wild salmon. This Implementation Plan sets out activities that will be undertaken from 2018-2022 to support the goal and objectives of the WSP in an incremental manner within available funding and the current policy context.

These activities build on best practices and lessons learned over the last 12 years and are woven throughout this Plan to illustrate some of the progress made since the WSP was released in 2005. The WSP guides work beyond that undertaken by DFO and it is understood that the goal of restoring and maintaining healthy and diverse salmon populations and their habitats cannot be achieved by DFO alone; rather, success depends on working in coordination and collaboration with others. This Plan, therefore, reflects some of the many contributions and successes of Indigenous peoples, communities, watershed groups, and other organizations dedicated to salmon and salmon habitat conservation.

Specifically, this document is scoped to:

- Plan for a five year timeframe;
- Include activities to be completed within available funding;
- Include activities to be completed within existing policy framework;
- Reflect guidance from the WSP;
- Include a process for reporting DFO-led activities; and
- Consider best practices, challenges, and lessons learned from pilot projects.

3.2 Structure of Plan

This Plan is structured around two key implementation themes that link to the strategies of the WSP: Assessment Work and Integrated Planning and Program Delivery. These themes are organized to reflect the integrative nature of the work and should not be viewed as linear or siloed. Figure 3.2 demonstrates the interrelated nature of these themes and the collaborative work, which is woven through Assessment Work and Integrated Planning and Program Delivery.

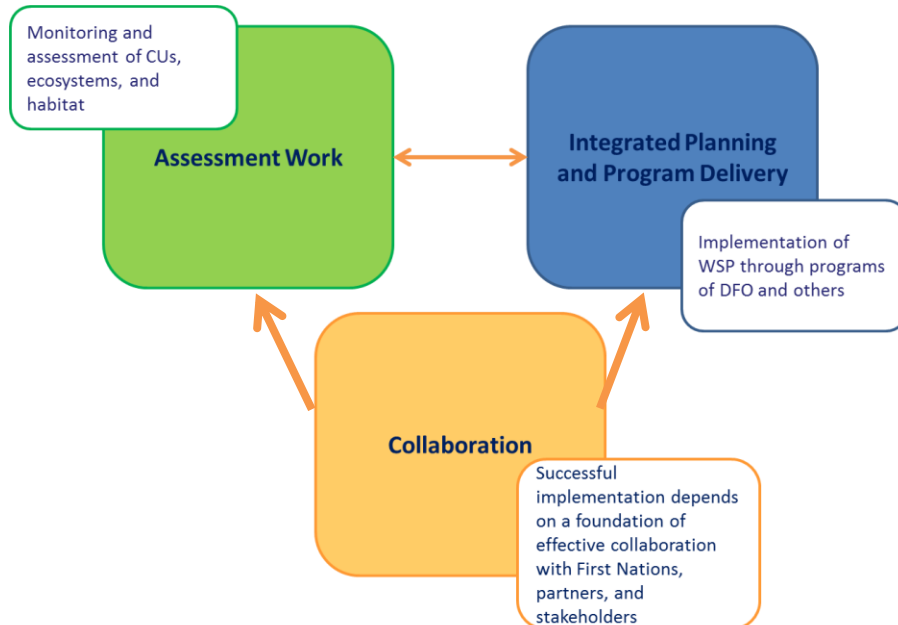
In this Plan, the Assessment Work theme captured in Section 4 reflects activities related to monitoring and assessing the biological status of salmon, their habitats, and ecosystems. This theme links to Strategies 1, 2, and 3 of the WSP, and reflects the interconnectedness between CU assessment and increasing knowledge of habitat and ecosystem status.

The scientific knowledge gathered through the activities completed in the Assessment Work theme feeds into work captured in the Integrated Planning and Program Delivery theme. This theme connects to Strategies 4 and 5 of the WSP and captures how the objectives of the WSP will be met through planning processes and program delivery.

These two sections include an overview of the strategies, highlights of progress to date, challenges and lessons learned, and a list of priorities for the next five years. Activity Tables in each section detail the specific Activities, key actors and target dates for completion of specific

work being undertaken in support of WSP objectives. Finally, the Performance Review and Evaluation section outlines how the Department will evaluate and report on the progress made towards implementation. A glossary defining key terms is included in Annex A.

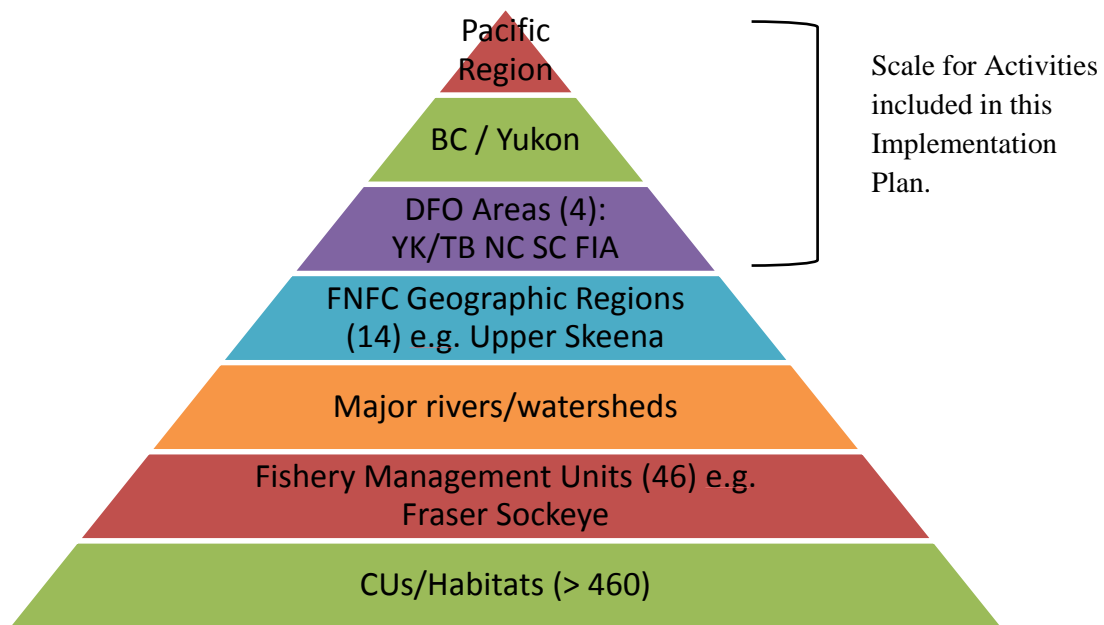
Figure 3.2: Implementation Themes



3.3 Plan Scale

Salmon are such an iconic species for the Pacific Region that work is undertaken at a number of scales. From the biological and physical characteristics of salmon and their freshwater and marine ecosystems to the multiple legal and policy frameworks and program governance structures that apply to Pacific salmon management to the range of actors interested in salmon and salmon habitat, project scales can vary from a small stream to the entire Pacific Region.

In selecting a scale for this document DFO focused on the human management scale (see Figure 3.3), and selected the scale to be at the Pacific Region/Area level (e.g. North Coast, South Coast, Yukon Transboundary and Fraser Interior) to balance comprehensiveness with manageability of information. This does not mean that there are not incredible projects being undertaken at a more refined scale.

Figure 3.3: Salmon Management Scales

4. Implementation Theme 1: Assessment Work

Understanding the current biological status of salmon, their habitats, and the ecosystems that depend on them is foundational to achieving the goals and objectives of the Wild Salmon Policy. To support this work, DFO and its partners, notably First Nations, local stream keepers, the Pacific Salmon Foundation (PSF) and others, monitor and assess salmon stocks and salmon habitat in BC and the Yukon. Within the Department, the responsibility for assessing and monitoring biological status resides in the Science Branch. Biological status assessments are used to advise Integrated Fisheries Management Plans (IFMPs), in-season fisheries management decisions and other day-to-day decisions that act to protect and restore wild salmon (see Section 5 on Integrated Planning and Program Delivery).

4.1 What the Policy Says

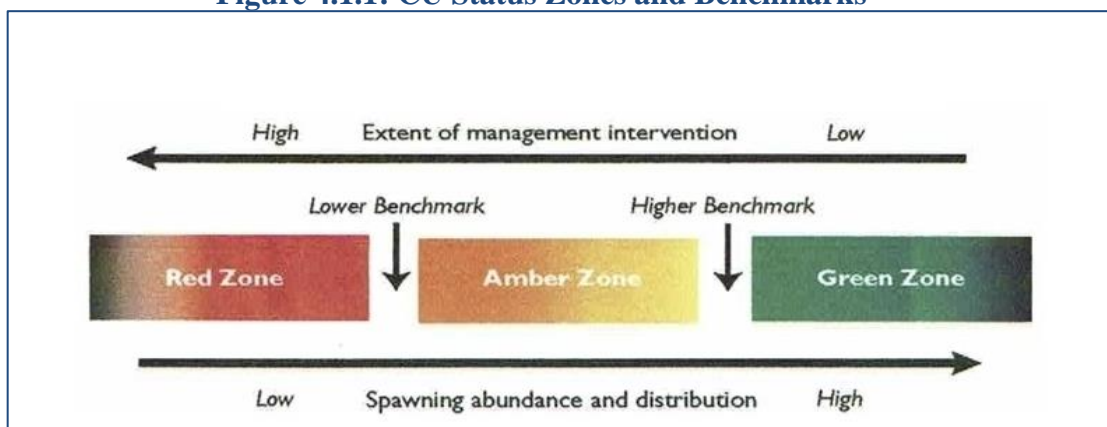
4.1.1 CU Assessment and Monitoring

Strategy 1 of the WSP calls for standardized monitoring of wild salmon status through three action steps: (1) identify Conservation Units; (2) develop criteria to assess CUs and identify benchmarks to represent biological status; and (3) monitor and assess the status of CUs.

CUs are the fundamental unit of Pacific salmon biodiversity. They consist of one or more genetically similar populations with a defined geographic distribution and dependence on a particular set of habitats. The delineation of CUs relies on biological information and local knowledge (e.g., ATK), where available.

The biological status of a CU is based on the abundance and distribution of spawners in the Unit. For each CU, higher and lower benchmarks are defined to delimit three status zones: Green, Amber, and Red (Figure 4.1.1). As spawner abundance and distribution decreases, a CU moves towards the lower status zone and the extent of management attention for conservation purposes increases.

Figure 4.1.1: CU Status Zones and Benchmarks



The lower benchmark between Red and Amber is set at a high enough level of abundance to provide a substantial buffer between it and any level where a CU would be considered at risk of extinction by Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The

higher benchmark between Green and Amber is set to identify whether harvests are less or greater than the level expected to provide, on average, the maximum annual catch for a CU under existing environmental conditions.

These benchmarks do not prescribe specific management actions, but rather are used to inform decision-making under Strategy 4 of the WSP. Changes in status will initiate management actions that will vary depending on species, geographic regions, and cause of the decline.

A prioritization scheme will be developed to identify CUs or groups of CUs for monitoring and assessment. Different levels of monitoring will be included, such as detailed indicator systems and intensive and extensive surveying.

4.1.2 Habitat Status Assessment

Strategy 2 of the Policy requires the assessment of habitat status in three steps: (1) document habitat characteristics within CUs; (2) select indicators (of habitat quantity and quality) and develop benchmarks for habitat assessment; and (3) monitor and assess habitat status.

4.1.3 Inclusion of Ecosystem Values and Monitoring

The WSP recognizes the challenges of identifying and measuring ecosystem values and of dealing with environmental uncertainty such as climate change. It favours a gradual approach to developing a scientific understanding and the technical capacity of including ecosystem values over time. Strategy 3 outlines the need to: (1) identify indicators to monitor status of freshwater ecosystems; and (2) integrate climate and ocean information into annual salmon management plans.

4.2 Progress to Date

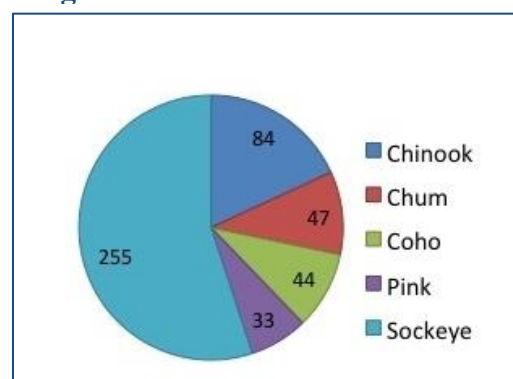
Substantial work has been completed on identifying salmon CUs in the Pacific Region, developing tools and methodologies for biological status assessment and reporting, and conducting CU and habitat status assessments.

4.2.1 Identification of CUs

DFO Science has developed a methodology for identifying the diversity of wild salmon and conducting an inventory of CUs for the five Pacific salmon species (Holtby and Ciruna 2007). CUs are delineated by their genetic traits, biogeographic distribution, life-history characteristics, and traditional knowledge.

To date, more than 460 CUs have been identified in BC and the Yukon, but numbers and boundaries will change as new information becomes available (Figure 4.2.1). This total is more than triple the number of CUs originally thought to exist when the WSP was being developed. While most CUs in BC have been identified and delineated, in the Yukon this work is in an earlier phase, with 19 CUs preliminarily identified in the Territory, excluding trans- border/boundary watershed CUs.

Figure 4.2.1: Total Salmon CUs



4.2.2 CU Assessment and Monitoring

A toolkit of metrics has been developed for assessing biological status under four classes of indicators: abundance, trends in abundance, distribution of spawning, and fishing mortality (Holt et al. 2009). For several metrics, a pair of benchmarks have been identified that may be common across all CUs (e.g., for trends in abundance metrics), although the exact values may differ (e.g., for abundance metrics). An appropriate suite of metrics and supporting information was selected and successfully applied in the first status assessments of Fraser River sockeye salmon, Southern BC chinook salmon, and Interior Fraser coho salmon CUs (DFO 2013, 2016 and 2015).

When the individual metrics are applied to assess status for a given CU, it is possible that each may indicate a different status zone. Therefore, a systematic approach has been developed to integrate biological status across the range of information available (Grant and Pestal 2013). A CU's first status assessment is conducted on a larger scale. This initial assessment typically involves a workshop where experts discuss the results for the various metrics, determine the CU's status, and document the factors that led to the particular status designation. Peer review occurs through the Canadian Scientific Advisory Secretariat (CSAS).

Recently, the first re-assessment of WSP biological status was conducted for Fraser River sockeye CUs. In this case, the assessment was conducted on a smaller scale, with fewer participants, and over a shorter timeframe.

In addition to the status assessments completed for Fraser River sockeye, Southern BC chinook, and Interior Fraser coho CUs, preliminary abundance metrics benchmarks have been identified for Barkley Sound sockeye, Skeena River salmon, Nass River salmon, and Strait of Georgia and Lower Fraser River coho CUs. Trends in abundance metrics benchmarks have also been applied to pink salmon CUs throughout British Columbia (Irvine et al. 2014). PSF is currently working with First Nations on the Central Coast to develop and propose preliminary metrics benchmarks for 116 salmon CUs. All of these metric benchmarks are preliminary because they have not undergone a formal status assessment process led by DFO.

To monitor and track CU status, DFO uses existing Stock Assessment Programs as well as partnerships with local groups, including First Nations and stream keeper groups. Monitoring data may include escapement and catch, and information on stock identification, sex, age, spawning success, and the fecundity of spawners. This data draws on a select number of intensively monitored sites, where more accurate and precise estimates of escapement, catch, and stock-recruitment are obtained; and extensively monitored sites, where escapements are monitored at a coarser level with lower precision and accuracy, but are over a much broader geographic area. Information from intensively monitored sites may also include data on returning adult salmon (age, sex, DNA, etc.), and on fry and juvenile fish.

Escapement is the number of salmon returning to the spawning grounds.

The **stock-recruitment** relationship is the number of adult salmon (recruits) produced for a given spawner abundance.

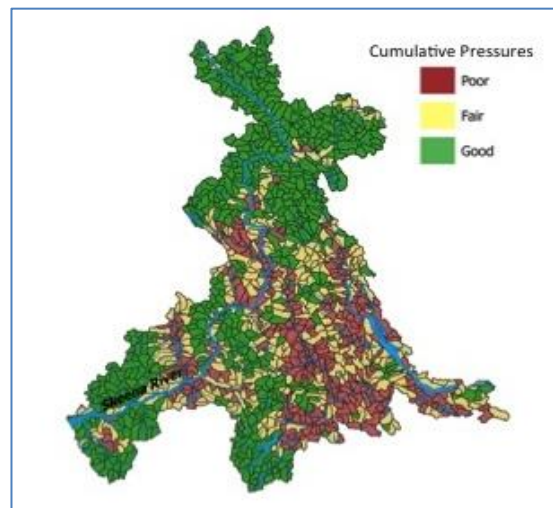
4.2.3 Access to CU Information

DFO stores up-to-date information on the number and identity of CUs in the New Salmon Escapement Database System (NuSEDS), which holds data on adult salmon escapement. This centralized database is available to the public through the Government of Canada's Open Data Portal. As the numbers and boundaries of CUs change over time, the database will be updated.

External partners work with CU info as well. One example is the work that PSF has been doing through its Salmon Watershed Program.

Partnering with federal and provincial government agencies, local First Nation communities, and NGOs, the PSF works to strengthen baseline information relevant to individual salmon CUs and pressures on their freshwater and estuarine habitats. In 2016, PSF launched an online data tool, the Pacific Salmon Explorer, which enables the visualization of information on salmon abundance, status and trends over time, and cumulative pressures on freshwater salmon habitats (see Figure 4.2.3), as well as custom reporting on individual CUs and the export of underlying datasets, which helps support technical objectives identified under Strategies 1 and 2 of the WSP. While PSF's assessment efforts have focused initially on the Skeena River, it is anticipated that the Pacific Salmon Explorer will eventually be expanded to provide information on salmon CUs for the rest of BC's North and Central Coast and more broadly across British Columbia. Salmon habitat report cards for the Nass area were developed by PSF in 2016 through direction from the Nisga'a Lisims Government, and in collaboration with the Gitanyow, Gitksan, and Lax Kw'alaams First Nations, Fisheries and Oceans Canada, BC Ministry of Environment, ESSA Technologies, and other local experts.

Figure 4.2.3: Cumulative Pressure Scores for Freshwater Habitats in the Skeena River Watershed



What partners are doing: public information tools example

The Pacific Salmon Explorer (www.salmonexplorer.ca) is an online data visualization tool that gives a high-level overview of salmon CUs in the northern coastal watersheds of the Skeena River. This innovative tool allows users to view more than 60 years of stock assessment data for each CU, and to interact with regional-scale maps showing risks to salmon habitat from land-use and environmental pressures. Users can print summary reports for CUs and download source datasets on salmon populations and their freshwater habitats.

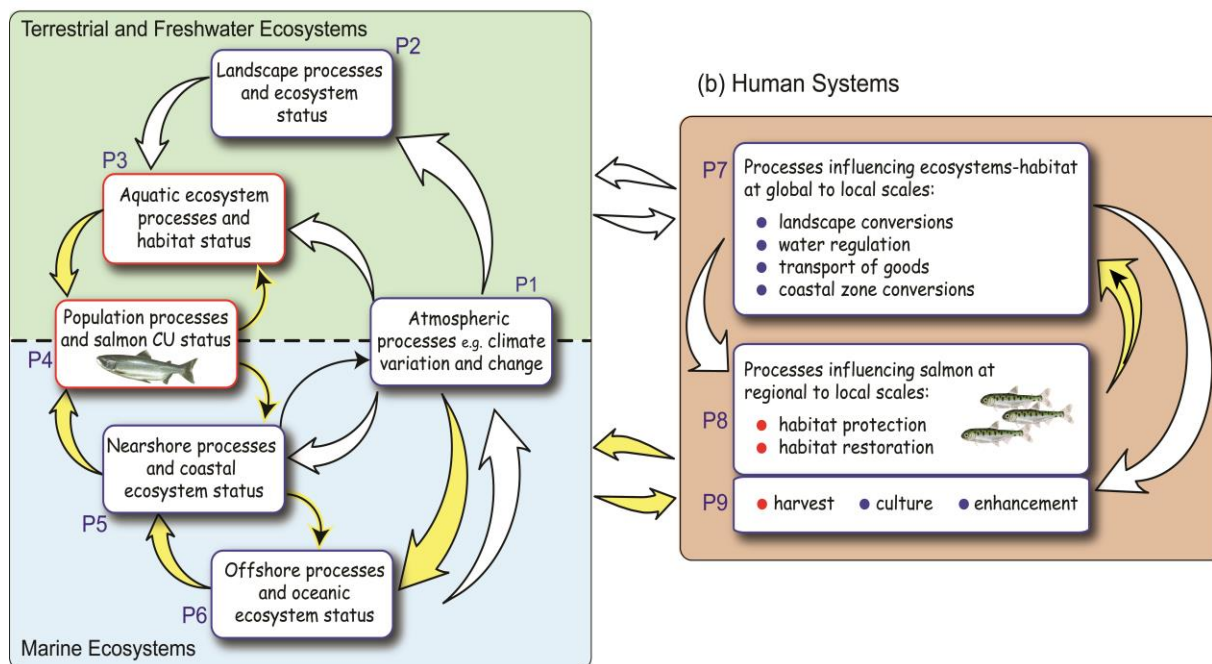
4.2.4 Ecosystem-Habitat Pressures on Wild Salmon CUs

Wild salmon complete their life history over a range of freshwater and marine habitats, such as rivers, lakes, nearshore coastal areas, and open ocean. There are differences in the temporal and spatial scales that the different salmon CUs spend in each of these habitats, and, by consequence,

differences in the level of impact to CUs from natural and human-induced changes to these habitats (e.g., drought, flood, forest cover removal, climate change). Furthermore salmon CUs face cumulative impacts across the range of habitats throughout their life history. It is evident that habitat characteristics play an important role in salmon CU productivity; thus it is important to understand the pressures on habitat and their role on influencing salmon productivity. At a broad scale, the natural and human-induced pressures on habitat that control salmon life history outcomes and subsequent production variations are understood (see Figure 4.2.4). In addition, there is evidence that salmon CUs exposed to similar habitat regimes tend to behave similarly to broad scale habitat pressures. As a result, there may be utility in grouping salmon CUs based on the characteristics of the habitat / ecosystem in which occupy, particularly within the freshwater environments, for assessment purposes. Such assessments would be based on data rich CUs (i.e., intensive assessments) within a defined habitat area and expanded to data poor CUs within the same defined ¹habitat (i.e., extensive assessments). As a collective, the productivity assessments of individual salmon CUs would be defined by habitat characterisation and assessments at a broad spatial scale (i.e., at the level of water sheds rather than individual tributaries). Since responsibility for ecosystem-habitat protection and restoration is not solely the responsibility of DFO, but shared with other levels of government, partnerships and collaborative work are critical to the maintenance of ecosystem and habitat integrity as key elements of implementation.

Figure 4.2.4 Natural and Human-Induced Pressures on Salmon Habitat

(a) Natural Systems



¹ Conceptual overview of ecosystem process-drivers, originating within natural or human systems that control salmon population trends and status. Yellow arrows highlight the subset of natural system and human system elements/activities for which DFO is principally responsible (P3, P4, P5, P6, P8, P9). Remaining arrows identify natural and human system process drivers for which other agencies are responsible (e.g. P1-Environment Canada; P2, P3, P7-BC-FLNRO). Red “bullets” identify limited set of local to regional scale activities over which DFO may exert direct control. Differences in arrow sizes are meant to convey some sense of the asymmetry in magnitude of the influence of process drivers on salmon within an ecosystem context.

4.2.5 Habitat Status Assessment

DFO has identified a preliminary suite of indicators and related benchmarks and metrics, for assessing freshwater habitats (streams, lakes, and estuaries) under the WSP (Stahlberg et al. 2009). The physical and chemical indicators are designed to measure the quantity of habitat (e.g., stream length, lakeshore spawning area), its state or condition (e.g., water temperature and quality, estuary contaminants), and habitat pressure from land and water uses (e.g., road development, water extraction).

These habitat indicators have been tested at different levels of assessment, from overview analyses of the habitat pressures in watersheds of CUs, to more detailed initial habitat status reports that examine highly productive and limiting habitats, and threats to them. Initial habitat status reports are being developed for pilot watersheds, including: Sarita River, Cowichan River, Somass River, Bedwell River, San Juan and Gordon rivers on Vancouver Island; and the Lower Harrison River on BC's Lower Mainland.

Habitat report cards can provide a snapshot of the current risks to salmon habitats in a watershed. They draw on pressure and state indicators, vulnerability indicators at different life-history stages, and benchmarks to assign an aggregate risk rating (Red/high, Amber/moderate, and Green/low) for salmon habitat. DFO has completed report cards on freshwater spawning and rearing habitat status for 35 Southern BC chinook CUs. The PSF has prepared regional-scale habitat report cards for salmon CUs in the Skeena River and Nass River watersheds. This work has involved gathering information on key habitat characteristics, such as migration distance and area of nursery lakes for sockeye.

4.2.6 Inclusion of Ecosystem Values and Monitoring

Ecosystem monitoring by its nature requires collaboration amongst a number of entities who may be collecting and monitoring data for various purposes and at various scales, and as previously discussed, salmon utilize both freshwater and marine environments. Therefore, work on including ecosystem values and monitoring for CU and habitat includes developing methods for incorporating ecosystem values into resource management decisions.

Ecosystem-based approaches in pilot areas, such as Barkley Sound, the Cowichan Watershed, the Okanagan Basin, and the Skeena River Watershed are being used by round table participants (including First Nations, the Government of BC, and local agencies) to determine the best way of incorporating this information in their area. The main focus of this effort has been on developing ecosystem-related indicators and science-based tools for integrating salmon conservation and other planning objectives. Examples include:

- Multi-trophic level (food-web-related) indicators of changes in lake ecosystems for Barkley Sound sockeye salmon;
- A web-based decision support tool for balancing fish protection and other water management objectives in the Okanagan Basin;
- Indicators of riparian ecosystem integrity for salmon-bearing streams based on changes in the salmon predator-scavenger complex; and
- A status assessment of the Skeena River estuary from the salmon perspective, using habitat pressure and state indicators of water quality, salmon habitat, food, and predation.

Research is also ongoing to better understand marine and freshwater ecosystems, including the impacts of climate change and oceanic conditions on salmon survival. Information on the impact of climate and oceanographic data on Pacific salmon (and other marine species) is provided in contributions to Canada's State of the Ocean reporting (Chandler, King and Perry 2015).

4.3 Challenges and Lessons Learned

Progress on the CU inventory and biological status assessments has produced some key lessons learned for further assessment work.

1. *Pacific wild salmon are biologically diverse.*

The large number of CUs identified to date (460+) reflects the high degree of biological diversity that has resulted from thousands of years of adaptation of wild salmon to their local freshwater and marine environments. As a species, pink salmon have the fewest number of CUs (33) and sockeye have the most (256). Sockeye CUs are typically delineated at the level of the individual sockeye-rearing lake(s), based on genetic information.

2. *Data deficiencies are a major concern for CU status assessments.*

For example, nine of the 35 Southern BC chinook CUs and the majority of Yukon River salmon CUs assessed were designated as data-deficient. In some cases, the problem is poor-quality adult salmon escapement data; in others, the spawner survey records exist but have not been entered into the Department's New Salmon Escapement Database System (NuSEDS). CUs can further be revised based on local traditional knowledge and biological information from DFO and non-DFO sources, and where escapement data are lacking a data-deficient status would also be applied.

3. *The identification and assessment of CUs is data-intensive and time-consuming, but there are opportunities for streamlining.*

The identification and assessment process take time and resources in part because of the need to develop tools and methodologies, technical challenges of data analysis (e.g., extracting CU-specific information from data historically collected on aggregate stocks), and the review processes involved. However, all of these elements are critical to ensuring a sound, science-based determination of CUs and their biological status as the basis for resource management decisions. Opportunities for efficiencies exist, such as closer collaboration with stakeholders already involved in assessments and a smaller peer-review process for periodic assessments of CU status that use methods previously reviewed including periodic re-assessments of CUs.

4. *A collaborative, transparent review process helps with the biological status assessments.*

A key success factor identified in the status assessment for Interior Fraser coho salmon was the collaboration with First Nations, which allowed for timely completion and a more robust assessment given the range of knowledge and experience considered. Another example is the Southern BC chinook Technical Working Group, which is co-chaired by DFO and First Nations and supported the WSP Assessment of Status for southern BC CUs.

The process for making an integrated CU status assessment generates not only the status zone designation stipulated in the policy, but also expert commentaries on the rationale behind the designation. These commentaries are helpful in informing fisheries management and other

program decisions under Strategy 4 of the policy. Building and sharing an understanding of the status of Pacific salmon and their habitats and ecosystems and factors limiting production helps to facilitate a transparent review process.

5. *Pacific Salmon Explorer is a user-friendly public information tool that offers a common baseline of CU status data.*

Like NuSEDS, the PSF database allows users to drill down to the source data underlying CUs and access information on salmon populations. The ability to link this information through a geographical interface presents maps of freshwater habitat status for different land use activities. This is helpful for First Nations, researchers and other groups who are interested in knowing the status of a local population rather than the CU aggregate, and can be useful in integrated planning.

6. *DFO's science-based risk assessment tools help build understanding and local capacity for the consideration of ecosystem values.*

Examples are the Fish Water Management Tool developed for fish protection in the Okanagan Basin, and the Risk Assessment for Salmon Methodology used to determine limiting factors for chinook production in the Cowichan River. These kinds of tools can be adapted to other locations and applications.

7. *A system is needed for prioritizing the assessment of CU status.*

There are different reasons why a CU, or group of CUs, may be identified for biological assessment, including international obligations, a decline of a major fishery, and indicator status to name a few. With limited resources, DFO needs a way to prioritize CU and habitat status assessment work.

4.4 Priorities for the Next Five Years

The Department has identified the following tasks to focus and further Pacific salmon assessment work over the implementation period:

- Assessment priorities – DFO Fisheries Management, with Science, will work on a method for prioritizing biological assessments based on conservation and other objectives.
- Data management and transmission – Consolidate data, method, and reporting standards for monitoring programs to support internal and external consistencies between data collection, including common descriptions of data quality and analyses.
- Finalization and monitoring of Yukon CUs – CUs have not yet been formally approved for the Yukon and northwestern BC transboundary River Areas, (i.e., the Yukon, Stikine, Taku, and Alsek River Drainages as well as portions of the Mackenzie River Drainage in northeast BC, although preliminary CUs exist.) This would be done in partnership with Yukon and northern BC First Nations and advisory agencies.
- Data-limited CU assessment – The status assessment process has focused on data-rich CUs. The coverage needs to be expanded by developing methods and metrics to assess data-limited CUs and combining with information for data-rich CUs across biogeo-climatic zones.

- Ecosystem and habitat - Develop and adapt a classification system for fresh and marine water ecosystems and habitats.
- Assessment of ecosystem-habitat status – Develop new tools (e.g. coast-wide indicator “stocks”, risk assessment frameworks and methods) to facilitate assessment of ecosystem-habitat status for salmon CUs,
- Ecosystem-habitat guidance documents – Develop/provide guidance documents regarding inclusion of multi-scale, ecosystem-habitat status and trend observations to inform salmon CU conservation and management.

These priorities are further detailed in the Activity Table that follows in Section 4.5

4.5 Activity Table

This is just an initial list of activities identified by Fisheries and Oceans Canada. Additional activities will be incorporated throughout Fall 2017.

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
WSP Objective 1 – Safeguard the genetic diversity of wild Pacific salmon	1.1 Continue to maintain a database of Conservation Units (CUs)	Region-wide					
		a. Make a current database that identifies CUs will be made available to the public via the Government of Canada's Open Data portal	Science			Annually by March 31	
		b. A framework for reviewing and approving revisions to CUs will be established	Science			March 2022	
WSP Objective 1 – Safeguard the genetic diversity of wild Pacific salmon	1.2 Continue to refine and expand on existing tools to assess CUs and identify benchmarks to represent biological status	Region-wide					
		a. As required when CUs with unique data sets cannot be fully assessed with existing status assessment tools, existing metrics will be modified or additional metrics will be developed and evaluated for CUs as prioritized by 1.3a	Science			Annually by March 31	
		b. Consolidate and improve documentation of standards for data, method, and reporting for monitoring programs	Science			Annually by March 31	
WSP Objective 1 – Safeguard the genetic diversity of wild Pacific	1.3 Continue to monitor and assess status of CUs	Region-Wide					
		a. Develop and refine a risk-based approach for identifying and prioritizing threats to CU sustainability	Science			Annually by March 31, starting in 2019	
		b. Use risk-based approach to	Fisheries			Annually	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
salmon		identify individual CUs or groups of CUs that are priorities for biological status assessments (links to risk based approach 1.3.a)	Management			By March 31	
		c. Documented status assessments for CUs or groups of CUs will be submitted for peer review through the Canadian Scientific Advisory Secretariat	Science			Annually, as available	
		d. Monitor, on a priority basis, CUs using indicator, intensive, and extensive monitoring approaches	Science			Annually by March 31	
		e. A database of spawner abundances that is linked to CUs will be maintained in the DFO NuSEDS database and published via the Open Data portal	Science			Annually by March 31	
		f. “State of Salmon” program developed to integrate freshwater and marine information and report annually in a “State of the Salmon” report	Science			September 2018	
		g. Engage in partnership activities in support of stock assessment work within First Nations’ traditional territories	Science			Annually by March 31	
		Fraser and Interior					
		h. As per Cohen recommendation #33, increase number of lakes in the Fraser Basin in which annual lake stock assessments and monitoring programs are conducted regarding fall fry populations from two to four	Science			Annually by March 31	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
WSP Objective 2 – Maintain habitat and ecosystem integrity	1.4 Define existing marine and freshwater classification systems for ecosystems & habitat	Region-wide					
		a. Develop and adapt a classification system for fresh and marine water ecosystems and habitats	Science			March 31, 2020	
		b. Identify a set of core environmental indicators associated with ecosystem units	Science			March 31, 2021	
		c. Provide recommendations on consolidating data associated with identified indicators	Science			March 31, 2022	
WSP Objective 2 – Maintain habitat and ecosystem integrity	1.5 Refine the regional system of intensive-extensive indicators	Region-wide					
		a. Develop a report to reflect environmental drivers of data rich CU status and trends in representative biogeo-climatic zones or ecoregions	Science			March 31, 2021	
		b. On a priority basis, ecosystem status, trends and associations will be assessed within a risk-based framework informed by observations of data rich and data limited CU indicators	Science			Annually, starting 2022	
WSP Objective 2 – Maintain habitat and ecosystem integrity	1.6 Monitor baseline conditions of ecosystems	Region-wide					
		a. Collect environmental data related to CUs (e.g. Monitor Fraser River temperature and flow)	Science				
WSP Objective 2 – Maintain	1.7 Extract relevant information on	Region-wide					
		a. Provide information to state of the Ocean forum	Science			Annually by March	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
habitat and ecosystem integrity	salmon CUs and environmental conditions in marine and freshwater ecosystems from ongoing State of the Ocean reports and other sources					31	
		b. Consolidate and supplement information on salmon from state of the Ocean Report and create a report on key interactions and outcomes for priority marine ecoregions	Science			Annually by March 31	
		c. Organize and hold forum to initiate assessments of status and trends of environmental conditions and salmon CUs in freshwater ecosystems	Science			Annually by March 31	
		d. Consolidate and supplement information on salmon and create a report on key interactions and outcomes for priority freshwater ecoregions	Science			Annually by March 31	
		e. Synthesize marine and freshwater information on salmon in State of the Salmon report	Science			Annually, beginning in 2019	
		Yukon Transboundary					
		f. Working with the U.S. (Alaska) explore development of summary reports on marine ecosystem information in the Gulf of Alaska and Bering Sea to track influence of major environmental drivers on variations in key salmon CU status and trend outcomes	Science			To be confirmed	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
WSP Objective 2 – Maintain habitat and ecosystem integrity	1.8 Assess impacts of natural and human induced stressors on CU status and trends (e.g., resource development, exploitation, climate change, etc.)	Region-wide					
		a. Use information from Activities under initiatives 1.4-1.7 to create, test and submit a risk assessment framework of natural and human induced stressors for scientific review	Science			March 2019	
		b. Based on recommendations of the scientific review, conduct, on a priority basis, risk assessments priorities	Science			Annually, following completion of scientific review	
		c. On an annual basis assess and document the status, trends and linkages of projects undertaken through the Pacific Salmon Foundation's Community Salmon Program within marine and freshwater habitats to enable strategic planning for future habitat and enhancement efforts	Ecosystems Management (SEP)	Pacific Salmon Foundation (TBC)		Annually, by March 31	Initiate April 1, 2018
		Yukon and Transboundary					
		d. Explore opportunity for development of data assembly and analysis to inform regional CU-EU conservation, protection, enhancement, and assessment priorities	Science				
WSP Objective 1 – Safeguard the genetic	1.9 Study the health of wild Pacific salmon	Region-wide					
		a. Investigate the use of new research tools to diagnose and study disease and other conditions	Science			To be confirmed	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
diversity of wild Pacific salmon		affecting wild salmon					
		b. Continue to co-lead the genomic research for the Strategic Salmon Health Initiative	Science	(TBC)		Annually, by March 31	
		Fraser and Interior					
		c. 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			To be confirmed	
		d. As per Cohen, undertake research at the mouth of the Fraser River to determine abundance, health, and condition of different CUs prior to entering the marine environment	Science			Ongoing	
		Yukon Transboundary					
		e. Monitor health of wild salmon stocks through provision of samples for pathological analysis	Science			Annually by March 31	
WSP Objective 2 – Maintain habitat and ecosystem integrity	1.10 Improve interagency collaborations	Region-wide					
		a. Support ongoing national and provincial initiatives and increase interagency communication on cumulative effects assessment and management issues pertaining to shared aquatic ecosystem values	Science; Ecosystem Management (FPP / SARA)			Ongoing (5year review)	

5. Implementation Theme 2: Integrated Planning and Program Delivery

Productivity and status of salmon populations are generally limited by a variety of biological factors and human threats. An integrated approach is required to address these. The Wild Salmon Policy recognizes the need for integrated strategic planning based on CUs, or CU aggregates, which in turn guides the development of annual work plans and program activities that specify harvest, habitat, and enhancement measures. Both the strategic planning process and the management actions that will be ultimately implemented will be led by DFO in conjunction with First Nations, other government agencies, and stakeholder groups.

5.1 What the Policy Says

5.1.1 Integrated Planning

The Wild Salmon Policy specifically identified integrated strategic planning as harvest planning, watershed planning and marine coastal planning. To better reflect the broader scope of work being undertaken, this Plan will consider integrated strategic planning to also include program planning and management decisions that affect salmon and salmon habitat by all DFO sectors.

Strategy 4 of the WSP called for the development of long-term strategic plans for CUs and groups of CUs and their habitat subject to common risk factors. These plans are meant to reflect local and regional interests and to integrate information on the status of CUs, their habitats, and the ecosystem. The policy outlined that these plans should:

- Specify long-term biological targets for CUs and CU aggregates that ensure conservation and sustainable use;
- Identify/recommend resource management actions to protect or restore Pacific salmon, their habitats, and ecosystems in order to achieve these targets; and
- Establish timeframes and priorities for actions.

“The lifecycle of the Pacific salmon necessitates a planning process that addresses salmon conservation from the eggs in the gravel in parental generations to the eggs in the gravel produced by their offspring.” DFO (2005), p. 24

Recognizing that this planning process would need time to develop, the policy outlined a two-phased approach to integrated planning:

- 1) Establish a collaborative interim planning process, building on IFMPs, that improves the integration of habitat, enhancement, fisheries, and marine area planning; and
- 2) Develop a new integrated planning structure that will better meet the needs of salmon and their environments over the long term.

Finally, the WSP outlined a five-step procedure for developing strategic plans: (1) identify planning priorities; (2) identify resource management options and alternative management strategies; (3) establish biological, social, and economic performance indicators; (4) assess the likely impacts of management alternatives; and (5) select the preferred management alternative.

5.1.2 Program Delivery

Strategy 5 of the Policy requires the development of annual work plans that set out specific management and program activities, in particular:

- Assessing CU status;
- Annual fishery plans, including requirements for fisheries and rules for in-season management;
- Annual work plans for habitat restoration and protection ; and
- Annual enhancement plans.

What partners are doing: local government initiative examples

Metro Vancouver regional parks are home to five hatcheries that produce a large number of salmon fry that are released in creeks and rivers in BC. Only one of these hatcheries (Capilano River) is operated by DFO. The hatcheries draw visitors to the parks, where public education programs on stewardship are supported by the PSF.

5.1.3 CUs in the Red Zone

The WSP identifies salmon CUs in the Red zone that are vulnerable to fisheries as a management priority. For these priority CUs, DFO should consult and collaborate with First Nations and other interests to gather information and make recommendations that will inform harvest, habitat, and enhancement planning. The Department should also pay attention to other vulnerable CUs (e.g., ones in the Amber zone) that could decline in status.

5.2 Progress to Date

Consistent with the intent of the WSP, implementation of Strategy 4 has occurred in an incremental manner and work continues to collaboratively develop CU-compliant integrated strategic plans as the resources and capacities of DFO and partners permit. The Department is still in the interim phase of integrated planning development; however, a series of pilots has successfully demonstrated the elements of an integrated planning approach. The Department is also incorporating WSP principles into its annual operating plans.

5.2.1 Salmon Planning Pilots

Several strategic planning initiatives have tested innovative, integrated planning at different geographic scales, which have six common steps:

1. Develop a clear vision and goals.
2. Understand the status of fish and fish habitat.
3. Identify limiting factors and threats, including either real or assessed risk.
4. Identify options and actions.
5. Develop strategic plans.
6. Implement and monitor the plans.

These pilots offer several lessons that can be used moving forward with WSP work, and are summarized below.

Fraser River Sockeye Spawning Initiative, FRSSI (2002–): The Department uses WSP principles in developing annual spawning escapement targets for Fraser River sockeye salmon. This process combines model simulations and workshops and feedback from First Nations and stakeholders to examine the long-term impact of different escapement strategies in achieving both conservation and harvest objectives.

What partners are doing: strategic planning examples

The Fraser Salmon Management Council represents 69 First Nations in the Fraser River Watershed and Vancouver Island and marine approach areas. The Council has been negotiating [*check status*] an agreement with DFO to provide input into management of the FSC fishery. An annual forum allows Council members to present their advice and recommendations on fishery management plans.

In 2015, the Nechako Watershed Roundtable was formed with membership from the provincial and local governments, First Nations, NGOs, and the public.

The Fraser Basin Council prepared a Watershed Strategy with actions to address priority concerns, including water quality and quantity, fish and wildlife, and ecosystems.

Skeena Watershed Initiative (2008–2011): This collaborative effort of First Nations, government agencies, and conservation and fishery interests looked at ways to improve the management of Skeena salmon and steelhead in a manner consistent with WSP guidance. The PSF sponsored a suite of scientific studies (e.g., enumeration surveys, CU and habitat status assessments) with funding from the Gordon and Betty Moore Foundation and the Living Rivers Trust Fund to support this work, which can be found at www.skeenawatershedinitiative.com

Barkley Sound Sockeye and Chinook: The Barkley Sound WSP pilot has explored the features of integrated management (CUs, habitats, ecosystem). The Area 23 Salmon Harvest Committee was created with First Nations and stakeholder members to advise DFO on annual harvest plans and in-season decisions. The committee has produced a local IFMP for sockeye salmon, and is developing another for chinook salmon. These plans use biological benchmarks and socio-economic factors to develop fishery reference points and decision rules to make harvest decisions. A similar table has formed in Area 25 Nootka where local chinook fishery plans are in development. Habitat status reports have been completed for 15 key chinook watersheds along the West Coast of Vancouver Island (WCVI).

A fishery reference point (FRP) is a point at which management actions occur. An example is the abundance of returning adults above which targeted harvest is considered. A limit reference point and an upper reference point define the boundaries for managing to protect stock status. FRPs are distinct from biological benchmarks.

Cowichan Watershed Health and Chinook Initiative (2010–): In the Cowichan Valley, First Nations and DFO have partnered with the municipal and provincial governments and local stakeholders to develop a salmon-focused community based initiative for watershed health. This initiative specifically recognizes chinook salmon as a key indicator species of ecosystem health. The result will be a strategic action plan with an emphasis on reducing risks to salmon production, and to achieve watershed health goals for hydrology, water quality, habitat, and the ecosystem/biological communities.

Southern BC Chinook Strategic Planning Initiative (2013–): DFO and First Nations have led a multi-stakeholder process to address the declines in many southern chinook salmon populations. This initiative is testing the WSP five-step planning procedure. It will produce a high-level

strategic plan that includes trends in aggregated CU and habitat status, limiting factors and threats, objectives, and management strategies. The strategies are broad in scope (harvest, hatcheries, habitat, ecosystems, etc.), but will not prescribe specific management actions.

5.2.2 The IFMP Framework

The Department's IFMPs provide the overarching guidance for annual salmon fisheries management in the Pacific Region.

WSP guidance has influenced the production of annual IFMPs in a number of ways, including:

- The scale of biological status assessment is now at the CU level. Associated fishery reference points and decision points might be at an aggregated CU scale (e.g., Management Units or MUs). For fishery structural reasons must consider accessing aggregate sustainable yield in a safe manner in addition to diversity at the CU level. However, balancing socio-economic and conservation factors may affect CUs within an MU differently.
- The WSP emphasizes the importance of a precautionary approach to resource management, including fisheries decision-making in the face of uncertainty (data analysis, environment) and poor biological status (setting of lower benchmarks).
- Habitat and ecosystem factors are now considered in fisheries management planning to a greater degree than in the past, particularly as they pertain to uncertainty in expected returns and the need to be precautionary in setting harvest levels.
- Consultations with First Nations on IFMP development have become more focused and rigorous in recent years. This is not solely because of the WSP but it is certainly consistent with its guiding principles and objectives.

A Management Unit (MU) is a group of salmon populations combined for the purposes of stock assessment and fisheries.

A new structure has been implemented for IFMPs in northern and southern BC, based on MUs. This new IFMP framework is easily adapted for consistency with WSP principles and can be applied at a local scale, as demonstrated by the Barkley Sound sockeye and chinook salmon plans.

5.2.3 Yukon First Nations Community Plans

Under the Yukon FNFAs, communities are developing local salmon management plans that reflect community interests and circumstances. These plans bring together stock assessment, conservation, harvest management, and habitat restoration. Some examples are provided below.

Tr'ondëk Hwëch'in (TH) is a self-governing Yukon First Nation whose name highlights the traditional importance of salmon harvest: Tr'ondëk refers to the confluence of the Klondike and Yukon Rivers, a place historically significant for harvesting chinook salmon. Hwëch'in means "people". The TH Traditional Territory is located in central Yukon, with Dawson City providing the base for the TH Government and many TH citizens. Dawson is the first community above the US border where the run comprises all Canadian-origin Yukon River chinook stocks. Historically, TH has been reliant on Yukon River chinook salmon to provide for their subsistence harvesting needs since time immemorial. TH was involved in the Yukon River treaty negotiation and is active in implementing influential harvest management measures. In 2013, TH citizens passed a resolution to voluntarily withdraw from subsistence harvest for one life cycle,

in order to improve border escapement and allow more chinook salmon to reach their Canadian spawning grounds. TH is active in local harvest management programs such as reduction in mesh size, releasing females, and promoting harvest of alternative species such as chum salmon during this time of chinook conservation.

Vuntut Gwitch'in First Nation (VGFN): VGFN is located in Old Crow on the Porcupine River, a large tributary to the Yukon River. Porcupine Fall chum stocks experienced a significant decline and are harvested in many mixed stock fisheries located downstream of the Canadian border. In 2016, the VGFN government expanded its fish management planning process to include US fishery managers and the community of Fort Yukon, AK, which fishes near the confluence of the two rivers. Already, this planning process has facilitated a better understanding of the issues between communities and potential measures for more effective conservation and harvest management.

Placeholder: To be updated with further information regarding Yukon First Nations Community Plans following consultation.

5.2.4 Program delivery

The WSP is one of a collection of policies and government directives that guide DFO's planning and program delivery for fisheries management. Programs have developed annual work plans that align with the WSP and factor it into daily decisions about fisheries management. The fisheries continue to evolve with these policies:

- Harvest policies adopted in Barkley terminal fisheries as a result of the collaborative planning process;
- Ongoing research on interactions between farmed and wild salmon and the environmental impacts of aquaculture operations;
- Substantial research into topics such as farmed vs wild, juvenile marine, and the Salish Sea Marine Protection Plan which brought about in part by the redirection of “salmon stamp” funds from recreational fisheries to the Pacific Salmon Foundation;
- Functioning roundtables along the WCVI;
- Interior Fraser River coho precautionary closures until clearer evidence of rebuilding or stability;
- Southern BC chum reduced mixed stock harvest in Johnstone Strait is commensurate with lower productivity & lack of data. Increased focus on terminal fisheries; and
- Barkley sockeye variable harvest strategy and local integrated fisheries management plan developed strong integrated management through roundtables which has nurtured this fishery to be one of the most stable on the WCVI.
- The incorporation of CU data into key fisheries and habitat management decisions.

5.3 Challenges and Lessons Learned

The experience from the WSP planning pilots has identified a number of lessons learned and factors for success that can be useful for future planning processes led by DFO and partners.

1. *Integrated planning needs to happen at different scales and over different timeframes.*

Integrated planning can mean multi-stakeholder, multi-spatial, multi-temporal, and/or multi-risk planning. The pilots outlined above have demonstrated comprehensive planning at a number of

these scales. For example, pilots have been at geographic scales ranging from a high-level regional perspective (i.e., Southern BC chinook) to the local watershed view (e.g., Cowichan and Barkley WCVI chinook strategic planning). In each case, the level at which the threats to wild salmon and potential actions are assessed serves a different management need.

“Look at best practices, gaps and lessons learned from WSP pilots to inform development of the implementation plan.”

Comment from the
2016 WSP Consultations

WSP principles and objectives will increasingly be the basis for annual operating plans (e.g., annual IFMPs and in-season decisions), as well as in multi-year strategic planning that combines fisheries management, habitat, enhancement, and ecosystem values.

2. There is no “one-size-fits-all” approach to planning under WSP guidance.

Although many of the lessons learned from the pilots can be used in other areas, there is no one size fits all due to different scales, and different focuses of planning teams (lead agency and participants) and specific management objectives. For example, the focus of local planning may be on salmon harvest (e.g., Barkley Sound IFMPs), salmon production (Cowichan Watershed Plan), or fish protection as one of a number of watershed goals (e.g., community-led water management plans). The Yukon First Nations community-based fish plans are examples of planning initiatives at a targeted local level.

3. A comprehensive view should be taken of the role of wild salmon and threats to their health.

Integrated planning aims to address the major pressures that limit or affect wild salmon status, especially those related to harvest, habitat, and hatcheries; in addition, the dual role of salmon as a keystone species and as an indicator species—i.e., of cumulative effects of environmental stressors across freshwater and marine habitats—needs to be emphasized. Other levels of government may not have the same commitment to the federal Wild Salmon Policy, but they readily grasp the broader importance of healthy salmon populations.

4. Collaboration and partnerships are crucial throughout the planning process.

The pilots have shown that effective planning depends on bringing the right participants to the table, in terms of who is most affected by salmon status (e.g., Indigenous people, fishers, conservation groups) and who has management interest (government agencies, First Nations). This may be done most efficiently by drawing on and supplementing existing processes and structures, such as local watershed roundtables.

“First Nations, through their rights, knowledge, and involvement in assessment work, can play a leadership role in bringing parties to the table for integrated planning.”

Comment from the
2016 WSP Consultations

First Nations, other partners, and stakeholders should be involved early on and throughout the planning process, including the setting of objectives and the development and evaluation of management strategies.

5. Each planning initiative should have a clear governance structure.

It is important to have a Terms of Reference that identifies the planning participants, their roles and responsibilities, objectives, process, timelines, resources, and deliverables (e.g., as done for the WCVI roundtable). The Southern BC chinook WSP pilot has used a novel governance approach of a bilateral DFO/First Nations steering and planning committee with representatives

from the BC government, the commercial and sport fishing industries, and environmental and stewardship groups.

6. The planning process must be supported by sound science and technical capacity.

Integrated planning needs science-based tools and expertise to help identify risk management options and evaluate trade-offs between different objectives (e.g., salmon conservation and

What partners are doing: international cooperation examples

The North Pacific Anadromous Fisheries Commission (NPAFC) was established by the *Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean*, which took effect in 1993. NPAFC members, including Canada, the US, Japan, South Korea, and Russia, work together on scientific research and fisheries enforcement to promote the conservation of Pacific salmon and steelhead trout. Ongoing efforts include the development of an International Year of the Salmon initiative across the northern hemisphere.

The Yukon River Panel, established in 2002 pursuant to Chapter 8 of the Pacific Salmon Treaty, serves as the international forum for Canada and the U.S. to collaborate on the conservation and management of Yukon River Salmon stocks. Chinook and fall chum salmon are the principle stocks of focus for the Panel, as these provide the foundation for significant subsistence, sport, domestic and commercial fisheries throughout the watershed. The Yukon River Panel also supports conservation, restoration and enhancement of Yukon River salmon and their habitats through the administration of the Yukon River Restoration and Enhancement Fund.

harvest). The pilots have produced risk assessment models and other tools that have advanced the science on salmon and habitat status and threat evaluation. Technical support has focussed on biological science and should be augmented in other areas, such as socio-economic analysis and Aboriginal traditional knowledge.

Generally, to be successful, there needs to be objective setting, sufficient data, analytical and interpretative capacity available to evaluate options, and ultimately rebuild and monitor CUs. All participants should be able to understand and provide input into the framing and technical analysis of management options.

What partners are doing: habitat stewardship examples

In 2006, the Cowichan Stewardship Roundtable coordinated a major habitat restoration project to stabilize the Stolz Bluff, which was releasing large amounts of sediment into the Cowichan River. This erosion had destroyed critical fish habitat and spawning grounds, threatening the survival of local chum, coho, and chinook salmon and steelhead. The project required the temporary diversion of a one-kilometer stretch of the river and the capture of 30,000 fish to install a larger berm structure to protect large clay bluffs from ongoing erosion. The results were a measureable decrease in suspended sediment, improved water quality, and improved biological productivity, including improved returns of salmon.

The Cougar Creek Streamkeepers (CCS) have championed the construction of rain gardens in North Delta, to reduce pollution from stormwater discharges. These gardens filter and recycle rainwater from roofs, parking lots, etc. The municipality, CCS, schoolchildren, and volunteers build and maintain the gardens.

7. Implementing WSP will, at times, require trade-offs between different interests.

The presence of salmon CUs in the Red zone will ultimately call for some difficult choices between conservation and other interests (e.g., harvest or development of industry). Consensus is desirable, but not always achievable. Under the Wild Salmon Policy, the Department has final authority for making management decisions that consider conservation and sustainable use and they should ensure decision-making processes are as transparent as possible.

8. Transparency means documenting how decisions were made at each stage of the process.

Integrated planning requires clear lines of communication between participants during the development of the plan, from the determination of objectives to the evaluation of management options. Moreover, the process needs to produce a transparent record of choices made along the way and their rationale, as well as of the scientific and technical aspects of decision-making.

9. *Every planning process needs enough resources and practical timelines.*

The pilots have taken considerable time and resources for DFO scientists and managers, and for partners and stakeholders participating in the process. Each planning initiative must have a realistic funding strategy, an adequate commitment of DFO staff and participant time, willing partners, good governance, adequate knowledge and data, and a pragmatic schedule for conducting the work. Going forward, there may be opportunities to improve efficiency, e.g., by developing guidelines or templates for integrated planning.

10. *Plans cannot succeed without support for implementation.*

DFO relies on partnerships to implement management actions for wild salmon and their habitats in areas where it does not have sole jurisdictional authority. In particular, First Nations, the Province of BC and local governments are key partners for implementation in freshwater habitats and traditional territories, respectively. The support of partners and stewardship groups is also essential for monitoring salmon and habitat status and the effectiveness of management actions.

“Effective integrated planning also requires strong legislation.”

Comment from the
2016 WSP Consultations

5.4 Priorities for the Next Five Years

The Department has identified some key tasks for this Plan, to fill knowledge gaps and make progress on the WSP objectives.

5.4.1 Integrated Planning

- Priority determination – DFO should identify priorities for WSP implementation, and guide this work with lessons learned. While planning initiatives will always have case-specific features, a guidance document should help to streamline and inform the process.
- Decision support processes and tools – Further development work and transparency is needed on tools such as statistical/ simulation models for evaluating resource management options, e.g. the development of fishery reference points and decision rules that consider biological, socio-economic and indigenous factors for harvest management.
- Risk-based prioritization of CUs – The WSP specifies that CUs in the Red zone and those that could significantly limit fishing and other activities will be management priorities. DFO Fisheries Management should develop and implement a risk-based approach for prioritizing CUs for the purposes of biological status assessment and resource planning, as capacity permits.
- New integrated planning processes – To continue the evolution of strategic planning, the Department should lead new processes (e.g., new pilots) and provide WSP guidance for watershed planning roundtables led by others (e.g., watershed-based fish sustainability plans, water management plans), as resources allow.

- Habitat and Ecosystem Integration – Focus on understanding and incorporating the habitat and ecosystem aspects of integrated management.

5.4.2 Program Delivery

- Implementation of existing strategic plans – DFO should work with existing IFMPs and other planning processes, management decisions and program activities, to ensure that actions in support of the WSP are considered in annual work plans for harvest, habitat management, enhancement, and ocean planning.
- Process for CUs in the Red and Amber zones – DFO has received feedback that there is not a clear process for triggering action when CU status is assessed in the Red zone, or is at risk of falling into the Red zone from Amber. It would be helpful to document guidance on the approach to responding to CUs in the Red or Amber zone.

These priorities are further detailed in the Activity Table that follows in Section 5.5

“There needs to be a commitment to quicker action with respect to CUs that are in the Red zone and how to prioritize.”

Comment from the
2016 WSP Consultations

5.5 Activity Table

This is just an initial list of activities identified by Fisheries and Oceans Canada. Additional activities will be incorporated throughout Fall 2017.

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
WSP Objective 3 – Manage fisheries for sustainable benefits	2.1 Improve integration of WSP objectives into existing planning processes, program activities, and management decisions for harvest, habitat, ecosystem, enhancement, and oceans management	Region-wide					
		a. Look for strategic opportunities to integrate WSP objectives into ongoing planning, management and program activities, within existing resources	Fisheries Management; Ecosystem Management			Annually by March 31	
		b. Clarify connections among CUs, freshwater and marine ecosystems, Fishery Management Units, and Outlook Units	Fisheries Management; Science			To be confirmed	
		c. Incorporate connections among CUs, freshwater and marine ecosystems, Fishery Management Units, and Outlook Units into existing planning, management and program activities as appropriate	Fisheries Management; Ecosystem Management			Annually, following completion of scientific review	
		d. Include information regarding how DFO considers CU status (i.e., red, amber, or green status) in integrated planning processes and in the development of IFMPs	Fisheries Management; Science			Annually, by IFMP completion date	
		e. Publish guidance outlining how DFO responds to red status CUs	Fisheries Management; Science			March 2022	
		Yukon Transboundary					
		f. Improve incorporation of existing, available habitat and ecosystem status information into Integrated Fisheries	Fisheries Management; Science			Annually by March 31	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
		Management Plans					
WSP Objective 3 – Manage fisheries for sustainable benefits	2.2 Develop and/or implement approaches to more explicitly incorporate assessments of biological, ecosystem, and habitat status into existing planning processes, program activities, and management decisions	Region-wide					
		a. Develop fishery reference points and associated decision rules that consider biological and other factors for harvest management	Fisheries Management			Ongoing	
		b. Apply risk based approach for identifying and prioritizing threats to CUs during integrated planning, management and program activities, as appropriate	Fisheries Management; Ecosystem Management			Annually, as required	
		c. Priority restoration activities informed by WSP objectives and related integrated planning processes where appropriate	Ecosystem Management (FPP / SEP)			Annually, as required	
		South Coast					
		d. 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	US Scientists; Pacific Salmon Foundation (TBC)	www.psf.ca	December 2019	
		Yukon Transboundary					
		e. Priority restoration activities informed by WSP objectives and related integrated planning processes where appropriate	Ecosystem Management (SEP)			Annually by March 31	
WSP Objective 3 – Manage fisheries for sustainable benefits	2.3 Continue to develop and implement more targeted approaches to	Region-wide					
		a. Support new and ongoing integrated planning, management and program activities to support WSP objectives	Ecosystem Management			Annually by March 31	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
	WSP integrated planning, program activities, and management decisions, as resources allow	b. Review and add to standards of best practice based on lessons learned	Fisheries Management; Science			Annually by March 31	
WSP Objective 3 – Manage fisheries for sustainable benefits	2.4 Improve the integration of programs by incorporating priorities related to WSP implementation into work planning processes	Region-wide					
		a. Consider WSP priorities, guiding principles and objectives in annual and multi-year work planning processes.	Fisheries Management; Science; Ecosystem Management			Annually by March 31	
		South Coast					
		b. Develop local integrated fisheries management plans for key areas including Barkley sockeye, WCVI chinook, WCVI chum, inside chum through local round tables.	Fisheries Management; Science	First Nations; stakeholders (TBC)		Ongoing	
		c. Incorporate WSP implementation priorities into integrated planning initiatives aimed at addressing WSP objectives (e.g., Barkley Sound sockeye)	Fisheries Management; Science; Ecosystem Management (SEP)			To be confirmed	
		Yukon Transboundary					
		d. Identify priorities for WSP implementation to guide annual and multi-year work planning processes by considering criteria that reflect the goal, guiding principles and objectives of the WSP	Fisheries Management; Science				

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
WSP Objective 2 – Maintain habitat and ecosystem integrity	2.5 Improve integration of WSP in Departmental habitat-related planning and decisions	Region-wide					
		a. Continue to support the consideration of the WSP when Ecosystem Management Branch makes regulatory decisions that may affect wild Pacific salmon habitat	Ecosystem Management (FPP)			Ongoing, as required	
WSP Objective 3 – Manage fisheries for sustainable benefits	2.6 Strengthen collaboration with First Nations, partners, and stakeholders to support WSP implementation	Region-wide					
		a. Support improvements to First Nations fisheries governance processes aimed at facilitating collaboration	Fisheries Management	First Nations (TBC)		Ongoing	
		b. Promote incorporation of WSP implementation priorities into projects with First Nations, partners, and stakeholders	Fisheries Management; Science; Ecosystem Management	First Nations; partners; stakeholders (TBC)		Ongoing	
		c. Continue to implement Fisheries Monitoring and Catch Reporting Framework to promote risk-based standards and monitoring of programs funded by harvesters	Fisheries Management			Ongoing	
		d. Explore opportunities to support fisheries management activities that would be beneficial to harvesters and support the WSP	Fisheries Management			Ongoing	
		e. Engage First Nations, partners, and stakeholders at the local level to leverage First Nations' traditional knowledge and local expertise and gain understanding of habitat status or other limiting factors of production	Fisheries Management; Science	First Nations; partners; stakeholders (TBC)		Ongoing	
		f. First Nations Fisheries Council and	Fisheries	First Nations		December	

WSP Objective	Initiative	Activity	Key DFO Sector(s)	Key Partners	Contact or Web Link	Target Date	Status
		DFO Science and Fisheries Management to collaborate to identify opportunities to better align scientific monitoring activities with First Nations opportunities and priorities	Management; Science	Fisheries Council (TBC)		2019	
		South Coast					
		g. Support building First Nations capacity to take leadership role in implementing adult salmon monitoring in key rivers such as Black Creek coho indicator with Atlegay Fisheries, Cowichan chinook indicator with Cowichan Tribes, Somass chinook and sockeye programs with Hupacasath and Tseshah, Sakinaw with Sechelt, and other extensive monitoring with local First Nations	Fisheries Management; Science	Atlegay; Cowichan Tribes; Hupacasath; Tseshah; Maa-nulth; and others (TBC)		Ongoing	
		h. Continue integration through local round tables along the WCVI, Cowichan, and other areas	Fisheries Management; Science	First Nations; stakeholders (TBC)		Ongoing	

6. Performance Evaluation and Reporting

6.1 Past Performance Review

6.1.1 Gardner Pinfold Performance Review

In 2011, Gardner Pinfold conducted an independent review of the Department's performance in achieving the goal and objectives of the WSP (Gardner Pinfold 2011). This review found that the rationale for the policy remained solid, but that a detailed five year timetable of activities should be developed to complement the WSP.

Other recommendations included a stronger departmental commitment to WSP funding; the identification by DFO of priority action steps; the target and use of resources strategically; the accountability for implementation of the WSP be given to a senior manager; and a strategic approach to consultation be adopted. The Gardner Pinfold report also suggested that annual work plan reviews should form "an integral part of WSP implementation and management,"², and that results should be publically reported on DFO's WSP webpage.

6.1.2 The Cohen Commission

In October 2012, the final report of the Cohen Commission was released (Cohen 2012). The report made specific recommendations with respect to the WSP, including the need for a detailed implementation plan, dedicated funding to carry it out, and annual progress reporting on implementation. The Cohen Commission also called for the assessment of conservation units and the initiation of integrated strategic planning processes for Fraser River sockeye salmon.

In August 2016, the Department issued an update on the implementation of the Cohen Commission's recommendations (DFO 2016). This report confirmed DFO's commitment to begin external consultations on a draft WSP Implementation Plan during 2016.

Similar to the findings of the Gardner Pinfold review, the Cohen Commission called upon DFO to create a detailed implementation plan for WSP and to report on the progress made towards implementation. Recommendation 8 in the Cohen Commission calls upon DFO to report annually on progress made towards implementation of the policy, and to make this report publically available both in writing and on the DFO WSP webpage.

6.2 Performance Evaluation

This WSP Implementation Plan represents a timetable of activities that are achievable within a five-year period. The results from a performance evaluation can guide decision-making, improve delivery of the initiative and enhance accountability not only during this time period, but also in informing next steps.

A performance evaluation provides a status update of the implementation of planned activities and helps to identify what is and what is not working to encourage continuous improvement over time. This includes ensuring expected outcomes are being achieved and that lessons learned and possible alternative options are being identified.

² Gardner Pinfold, Performance Review of the Wild Salmon Policy, 2011, pg. 31

Strategy 6 of the WSP, Performance Review, envisions two types of performance reviews associated with WSP implementation: annual post-season reviews of work plans at the program level and regular reviews of the broader success of the implementation of the WSP. Therefore, the activities in this Implementation Plan will be reviewed on an annual basis, while a more comprehensive review will occur at the end of the five year period to ensure broader success towards the goal of the WSP. As it is anticipated that there could be additional activities following the release of an updated *Fisheries Act*, this Implementation Plan will also have a mid-cycle review. DFO will be accountable for reporting against activities for which the Department is accountable and will seek input on status of externally led activities on an annual basis, with information made available also shared.

6.3 Reporting

The need for public reporting has been outlined in the WSP, the Gardner Pinfold review, and the findings of the Cohen Commission. The Department is committed to reporting progress on its activities publicly in line with the Department's regular business planning and reporting processes. Public reporting of progress made towards meeting the objectives of this Plan aligns with the Government of Canada's commitment to open government by fostering transparency, accountability, and engagement.

Throughout this Plan, work being done by others is included to showcase the varied efforts underway to conserve and restore wild salmon. For the purposes of accountability, DFO will be reporting out on activities being led by Fisheries and Oceans staff as captured in the Activities Tables.

Throughout consultations, the public has been anxious to know when the WSP will be fully implemented. As a policy, the WSP guides DFO's work and as such there is no specific end-date to the WSP or finishing the work. However, within the Policy are strategies for work which needs to be completed to get closer to the goals of the WSP.

7. Looking Forward

Through the development of this Plan and through reflection on past implementation efforts, DFO and partners have identified successes and opportunities for future work. Building on both, and identifying the work that remains ahead, will help inform the priorities of the Department moving forward as it continues to work with partners towards restoring and maintaining healthy and diverse salmon populations and their habitats for the benefit and enjoyment of the people of Canada.



Wild salmon are an iconic species in BC and Yukon, holding significant social, cultural, and economic value for Indigenous and non-Indigenous Canadians alike. The WSP recognizes the importance of wild Pacific salmon and this Implementation Plan represents DFO's and others' commitment to salmon conservation and restoration by setting out the activities that will be undertaken over the next five years to advance the goal and objectives of the WSP.

DRAFT

Annex A – Glossary

Aboriginal rights: Practices, customs, and traditions that distinguish the unique culture of each First Nation.

Aboriginal title: The right of First Nations to use their traditional lands and waters.

Aboriginal Traditional Knowledge (ATK): A collection of knowledge, practice, and belief unique to indigenous people and passed down through generations.

Aquaculture: The farming of aquatic organisms in the marine environment or freshwater.

Basic Needs Level: The total number of harvestable salmon of a particular species negotiated in a Yukon First Nations Agreement as a harvest allocation to the First Nation in its Traditional Territory.

Benchmark: A standard (quantified metric) against which habitat or population status can be measured or judged, and by which status can be compared over time and space to determine the risk of adverse effects. For instance, biological benchmarks demarcate zones of population status based on conservation and production considerations (Holt and Irvine 2013).

Biodiversity or biological diversity: The full range of variety and variability within and among living organisms and the ecological complexes in which they occur; and encompass diversity at the ecosystem, community, species, and genetic levels and the interaction of these components.

Biophysical: Biological and physical factors that influence ecological processes or events.

Conservation: The protection, maintenance, and rehabilitation of genetic diversity, species, and ecosystems to sustain biodiversity and the continuance of evolutionary and natural production processes.

Conservation Unit (CU): A group of wild salmon sufficiently isolated from other groups that, if extirpated, is very unlikely to recolonize naturally within an acceptable timeframe.

COSEWIC: Committee on the Status of Endangered Wildlife in Canada.

Cumulative effects or cumulative impacts: Changes to environmental, social and economic values caused by the combined effect of past to present activities and events. Within a WSP context, status changes to wild salmon conservation units and the ecosystem units required to sustain them are key cumulative effects indicators.

Diversity (of salmon): The genetic variation and adaptations to different environments that have accumulated between populations of salmon (defined by the 2005 Wild Salmon Policy).

Ecosystem: A community of organisms plus physical and chemical conditions of their environment interacting as an ecological unit.

Ecosystem integrity: The physical, chemical and biological structure and processes that characterize specific ecosystems.

Ecosystem values: Attributes or properties of ecosystems that society wishes to sustain. Freshwater ecosystem integrity, salmon biodiversity and sustainable fisheries for salmon are examples of ecosystem values within a WSP context.

Enhancement: The application of biological and technical knowledge and capabilities to increase the productivity of fish stocks. It may be achieved by altering habitat attributes (e.g., habitat restoration) or by using fish culture techniques (e.g., hatcheries, spawning channels). In the context of the WSP, only salmon originating directly from hatcheries and managed spawning channels will be considered enhanced.

Escapement: The number of mature salmon that pass through (or escape) fisheries and return to fresh water to spawn.

Estuarine staging area: An ecosystem unit used as a transitional area in which either juvenile salmon migrating seaward, or adult salmon migrating landward, may aggregate or “stage” for a variable interval to adjust physiologically to the sharp differences in the chemical composition of fresh versus marine waters before resuming active migration.

Fish habitat: Spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.

Fishery Reference Point (FRP): A point at which management actions occur. An example is the abundance of returning adults above which targeted harvest is considered. A limit reference point and an upper reference point define the boundaries for managing to protect stock status. FRPs are distinct from biological benchmarks.

Genetic diversity: The variation at the level of individual genes, and provides a mechanism for populations to adapt to their ever-changing environment. It refers to the differences in genetic make-up among distinct species and to genetic variations within a single species.

Habitat restoration: Physical or chemical manipulations to create a natural or normative reference state of habitat that has been altered, disrupted, or degraded. Successful restoration increases the capability of previously damaged habitat to sustain fish production.

Integrated Fisheries Management Plans (IFMPs): Integrated Fisheries Management Plans are used by DFO to guide the conservation and sustainable use of marine resources. An IFMP is developed to manage the fishery of a particular species in a given region. IFMPs combine the best available science on a species with industry data on capacity and methods for harvesting that species.

Extensive monitoring approaches: Simple sets of a few attributes of a given subject and/or its surroundings are identified and used to provide a synoptic assessment of the status or trends exhibited by the subject in space or time. In a WSP context, this involves annual monitoring of a limited number of attributes (e.g. catch and/or escapement) of many CUs and how these vary over space and time.

Intensive monitoring approaches: Complex sets of many attributes of a given subject and/or its surroundings are identified and quantified in order to advance knowledge and/or develop indicators for prediction or explanation of cause and effect interactions. In a WSP context, this involves seasonal to annual monitoring of suites of attributes of a given salmon CU (e.g. individual and population level biological traits) as well as associated EU attributes (e.g. physical, chemical and ecological properties of the environment of a given CU) and how these vary in space and time.

Keystone species: A keystone species is a species that has a disproportionately large effect on its environment relative to its abundance. Such species are described as playing a critical role in maintaining the structure of an ecological community, affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community. Pacific salmon are regarded as keystone species due to their disproportionate impact as sources of food and nutrients that demonstrably limit the distribution and abundance of a wide range of both plant and animal species in freshwater and associated terrestrial ecosystems.

Limiting factors: Physical, chemical or biological factors that control ecological or life history event and process outcomes.

Lower benchmark: A reference point in biological status associated with significant losses in production between the Amber and Red zones, and which allows for a substantial buffer between it and any level of abundance that could lead to a CU being considered at risk of extinction by COSEWIC.

Management Unit (MU): A group of salmon populations combined for the purposes of stock assessment and fisheries.

Marine adaptive zones: The unique combination of marine ecosystem units to which each wild salmon CU is assumed to have accumulated specific adaptations over evolutionary time.

Metric: A quantifiable measure.

Multi-scalar: Literally many scales that characterize systems of spatial or temporal measurement. For example the life history stages of Pacific salmon occupy multi-scalar spaces and temporal intervals. These may be measured at a scale of cm to m and days to months with respect to egg incubation in gravel spawning areas. Alternately the physical length and elapsed intervals for adult migration through freshwater and the open ocean involve measures at scales up to thousands of km and years of time.

Multi-trophic: A trophic level is a functional classification of organisms in a community according to feeding relationships. Ecosystems contain multiple trophic levels consisting of plants, grazers, predators, scavengers etc.

Pacific salmon: Salmon of the Pacific Ocean regions, of which there are currently eleven species recognized in the Genus *Oncorhynchus*. The five species addressed in this policy are sockeye

(*Oncorhynchus nerka*), pink (*O. gorbuscha*), chum (*O. keta*), coho (*O. kisutch*) and chinook (*O. tshawytscha*). Also in BC are steelhead (*O. mykiss*) and cutthroat trout (*O. clarki*). The remaining species include the masu (Asian distribution, *O. masou*), Mexican golden trout (*O. chrysogaster*), apache trout (*O. apache*), and gila trout (*O. gilae*). These latter three species have limited distributions in the western U.S. and northern Mexico.

Population: A group of interbreeding organisms that is relatively isolated (i.e. demographically uncoupled) from other such groups and is likely adapted to the local habitat.

Precautionary approach: When used in an advisory context in support of decision-making by the Government of Canada, this term conveys the sense that the advice is provided in situations of high scientific uncertainty. It is intended to promote actions that would result in a low probability of harm that is serious or difficult to reverse.

Predator-scavenger complex (PSC): An ecological community consisting of many species of animals that obtain a significant portion of their seasonal to annual food requirements by killing or scavenging and then eating a common species. In British Columbia the salmon PSC comprises at least 23 species of mammals and birds that consume adult fish returning to British Columbia rivers and streams.

Productivity: A measure of the amount of energy (or material) formed by an individual population or community in a specific amount of time. Within a WSP context, some common measures of productivity include the number of fry, smolts or subsequent adults (i.e. recruits) produced on average per spawning adult of the previous generation.

Recruits per spawner: The number of adult recruits (i.e. salmon that survive to become adults, which includes spawners and catch) produced per spawner, typically organized by brood (spawning) year.

Resource management: Departmental actions, policies and programs affecting wild Pacific salmon directly or indirectly through their habitats and ecosystems.

Returns: Total number of adults returning to freshwater to spawn in a given year, including those caught in fisheries.

Riparian zone and functions: The area of vegetation near streams is known as the riparian zone. Riparian function includes the interaction of hydrologic, geomorphic, and biotic processes within the riparian environment that determine the character of the riparian zone and the influences exerted on the adjacent aquatic and terrestrial environments (e.g., temperature controls, shading, large woody debris).

Salmonid: A group of fish that includes salmon, trout, and char, belonging to the taxonomic Family Salmonidae.

Selective fishing: A conservation-based management approach that allows for the harvest of surplus target species while aiming to minimize or avoid the harvest of species or stocks of concern or to release bycatch unharmed.

Smolt: A juvenile salmon enroute to the marine environment. A smolt becomes physiologically capable of balancing salt and water in the estuary and ocean waters. Smolts vary in size and age depending on their species.

Spatial and temporal scales: Graduated systems of units or scales (e.g. cm, m, km, hours, days, years, centuries etc.) employed to measure spatial or temporal dimensions of objects, events and processes.

Species: The fundamental category of taxonomic classification consisting of organisms grouped by virtue of their common attributes and capable of interbreeding. A taxonomic species is equivalent to the term “species” but the phrase may be used to indicate the collective species throughout its distribution.

Stewardship: Acting responsibly to conserve fish and their habitat for present and future generations.

Stock assessment: The use of various statistical and mathematical calculations to make quantitative predictions about the reactions of fish populations to alternative management choices.

Stock-recruitment relationship: The number of adult salmon (recruits) produced for a given spawner abundance.

Sustainable Use and Benefit: The use of resources in a way and at a rate that does not lead to their long-term decline, thereby maintaining the potential for future generations to meet their needs and aspirations. Sustainable use refers to consumptive uses of biological resources. Sustainable benefits, on the other hand, derive from a broader range of consumptive and non-consumptive resource uses.

Total Allowable Catch (TAC): In the Yukon, TAC means the number of salmon of a particular species in a given drainage basin that return to Canadian waters and are deemed not necessary for conservation.

Terminal fisheries: Fisheries that occur near or in fresh water (e.g., at a river’s mouth) where the targeted species or stock has returned to spawn.

Treaty rights: Aboriginal rights set out in a treaty and constitutionally protected.

Upper (or higher) benchmark: A reference point in biological status associated with harvests at the level expected to provide, on an average annual basis, the maximum catch for a CU, given existing environmental conditions.

Wild salmon: Salmon are considered “wild” if they have spent their entire life cycle in the wild and originate from parents that were also produced by natural spawning and continuously lived in the wild.

