Wild Salmon Policy

DRAFT Implementation Gap Analysis

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Fisheries and Oceans Canada

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1. Introduction

Over recent decades, the management of Canada's Pacific salmon has become more challenging due to Supreme Court decisions, new international agreements (e.g., UN Convention on Biological Diversity and renewal of the Pacific Salmon Treaty) new legislation (*Oceans* and *Species at Risk* Acts), climate change, habitat loss, shifts in global seafood markets, and altered public expectations around conservation of wild stocks.

In response to these challenges and growing public concern for effective conservation of wild salmon, Fisheries and Oceans Canada set out a *New Direction* for Pacific salmon management in 1998. The *New Direction* was guided by twelve principles grouped under three key themes: conservation, sustainable use, and improved decision-making. As part of the *New Direction*, the Department released the *Wild Salmon Policy* (WSP) in 2005[1] following extensive consultations with various stakeholders including First Nations, commercial and recreational fisheries representatives, environmental groups, and interested members of the public.[2]

Consistent with the *New Direction*, the WSP describes how DFO will meet its responsibilities for the conservation of wild Pacific salmon. It stipulates overall policy goals for wild salmon, identifies basic principles to guide resource management decision-making, and sets out objectives and strategies to achieve the goal. The goal of the WSP is *to restore and maintain healthy and diverse salmon populations and their habitats for the benefit and enjoyment of Canadians in perpetuity*. The goal is advanced by promoting the following principles: conservation of wild salmon and their habitat as the highest priority for decision-making, honour Canada's obligations to First Nations, consider biological, social, and economic consequences, and seek meaningful public input.

The WSP requires that all DFO decisions and activities pertaining to the conservation of wild Pacific salmon will be guided by four principles:

1. Conservation of wild Pacific salmon and their habitats is the highest priority in resource management decision-making.
2. Honour obligations to First Nations.
3. Sustainable Use.
4. Open Process.

The WSP also requires the Department to conduct an independent review of the success of the policy in achieving its broad goals and objectives within five years of its adoption. In preparation for the WSP five-year review, the WSP Implementation Team is conducting a gap analysis of WSP implementation. This report looks at the progress made towards implementation of WSP, recognizes gaps in implementation, and identifies opportunities for moving forward on WSP.

[1] DFO. 2005. Canada's Policy for Conservation of Wild Pacific Salmon. (http://www.pac.dfo-mpo.gc.ca/publications/pdfs/wsp-eng.pdf)

[2] WSP development was reviewed by Irvine, J. R. 2009. The successful completion of scientific public policy: lessons learned while developing Canada's Wild Salmon Policy. Environmental Science & Policy **12**(2): 140-148. (http://www.sfu.ca/cs/science/resources/salmon/irvine%20envscipol09%20lessons%20from%20wsp.pdf)

2. WSP Implementation

2.1. Principle 1: Conservation as the Highest Priority

The WSP commits the DFO to placing conservation of wild Pacific salmon and their habitats as the highest priority in resource management decision-making. This WSP principle is consistent with the Department's *Sustainable Fisheries Framework*, which[3] forms the basis for all fisheries decision-making. The Framework includes conservation and sustainable use policies that incorporate precautionary and ecosystem approaches[4] into fisheries management decisions, which is consistent with WSP principles and objectives to ensure continued health and productivity of fisheries and healthy fish populations, while protecting biodiversity and fisheries habitat. The implementation of this framework into all fisheries will be phased-in over time and will support implementation of the WSP.

The Department has adopted the principle of conservation as the highest priority in decision-making through its day-to-day operations. Examples of this include:

- The 2008 Pacific Salmon Commission (PSC) negotiating principles agreed to between Canada and the US placed conservation as the high priority;
- Fishery timing windows have been adjusted to protect weak populations by ensuring low to moderate fishery exploitation levels;
- Considerable assessment and management effort is put into determining and maintaining appropriate harvest levels in mixed-stock fisheries;[5]
- Closure of or restrictions to fisheries that impact stocks that are of conservation concern;
- Use of selective gear-types to reduce by-catch; and,
- Recovery planning and enhancement activities have been undertaken to rebuild and recover CUs experiencing poor survival rates.

Some gaps in the implementation of this principle include:

- Absence of management objectives for each CU.
- A framework to evaluate the effectiveness of fisheries management decisions.
- Finalization of all aspects of the *Sustainable Fisheries Framework.*

2.2. Principle 2: Honour Obligations to First Nations

Principle 2 confirms DFO's commitment to honour its obligations to First Nations, including the legal duty to consult and accommodate their interests when Canada has knowledge of the potential existence of an Aboriginal right or Aboriginal title and is making decisions that might adversely affect the right or

[3] For more information on the Sustainable Fisheries Framework, go to: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

[4] An ecosystem approach requires that fisheries management decisions consider the impact of the fishery not only on the target species, but also on non-target species, seafloor habitats, and the ecosystems of which these species are a part. This approach also requires that management decisions take into account changes in the ecosystem which may affect the species being fished. This includes the effects of weather and climate, and the interactions of target fish stocks with predators, competitors, and prey species.

[5] Although Conservation Units are unique, they are often harvested in in areas where they mix together. Some of these units may be less productive than others, yet subject to the same exploitation rate as more productive (and typically more abundant) populations. If the exploitation rate is too high for less productive units, they may decline. The technical terminology for this phenomenon is "mixed-stock fisheries which result in recruitment over-fishing on less productive populations", because the harvest may exceed the number of adult offspring (a.k.a. recruits) produced by the parent generation. This management challenge of mixed-stock fisheries is further complicated by large-scale hatchery production which artificially increases the amount of salmon production in an area.

title. Additionally, resource management processes and decisions are in accordance with the *Nisga'a Final Agreement*, the *Yukon Final Agreements, Tsawwassen First Nation Final Agreement*, the *Maa-nulth First Nations Final Agreement*, and any other treaties or agreements entered into between Canada and First Nations.

DFO assists Indian and Northern Affairs Canada (INAC) with respect to the fisheries and oceans components of land claims and self-government agreements. These negotiations are led by INAC and aim to achieve certainty with respect to Aboriginal and treaty rights.

The WSP is only one of many of DFO's programs and policies that honour its obligations to First Nations. DFO's Aboriginal programs in the Pacific Region[6] are designed to strengthen the relationship between the federal government and Aboriginal groups and communities by supporting integration in the commercial fishery and the development of scientific, technical, and administrative capacity of Aboriginal groups. DFO's programs also support Aboriginal group's participation in the multilateral decision-making and advisory processes used by the Department to manage aquatic resources and ocean spaces.

Where DFO has determined that there is a legal duty to consult with Aboriginal groups, Resource Management staff ensures that the existing process for consultations, or any new process designed for this purpose, meets the requirements outlined in the *Interim Guidelines for Federal Officials to Fulfill the Legal Duty to Consult, February 2008.* Additionally, with *Canadian Environmental Assessment Act* (CEAA) and habitat regulatory decisions, DFO communicates with all First Nations where an impact may occur to seek their input and determine if their interest can be accommodated. The Department has also developed decision tools and template letters to help habitat practitioners meet the DFO's duty to consult.

Some specific examples of how DFO resource management processes and decisions honour Canada's obligations to First Nations include:

- As per the *Yukon Umbrella Final Agreement*, DFO meets with the Yukon Fish and Wild Life Management Board (First Nations and non-First Nations members) annually to review fishery management decisions;
- DFO has developed co-management relationships through local roundtables (e.g., Barkley Sound Harvest Roundtable, Somass First Nations Chum and Chinook Conuma Roundtable, Cowichan Stewardship and Water Use Roundtable, Skeena Watershed Initiative), bilateral engagement, and technical working groups (e.g., Fraser Technical Committee and technical collaboration with the Nuu-chah-nulth on warm-water low flow and other climate conditions) where First Nations are represented.
- Establishment of larger forums or groups of Aboriginal communities on harvest and habitat issues (e.g., Interim Fraser River and Approach Working Group (I-FRAWG), First Nations Fisheries Commission (FNFC), Fraser River Aboriginal Fisheries Secretariat (FRAFS), and Intertribal Treaty Organisation (ITO)) has enhanced information sharing and collaboration, and contributes to integrated ecosystem/watershed management and planning.
- Fishery timing windows have been adjusted to protect weak stocks that are of concern to First Nations by ensuring low to moderate fishery exploitation levels, for example harvest on Bulkley River sockeye is timed to avoid harvest of the Namika sockeye CU, which provide FSC for the Wet'suwet'en.

[6] Aboriginal Fisheries Strategy (AFS); Allocation Transfer Program (ATP); Aboriginal Aquatic Resource and Oceans Management (AAROM) Program; Aboriginal; Aboriginal Funding for Species at Risk; and Pacific Integrated Commercial Fisheries Initiative (PICFI).

- Monitoring has been increased on some stocks of concern to First Nations, for example, an enumeration fence has been built for the Kitwanga sockeye CU due to concern expressed by the Gitanyow.
- DFO manages fisheries to ensure that, after conservation needs are met, First Nations' FSC requirements and treaty obligations to First Nations have first priority in salmon allocation in accordance with the *Allocation Policy for Pacific Salmon*.[7]

There is increasing interest of Aboriginal groups in all aspects of aquatic resources, including co-management and participation in fisheries. As such, Aboriginal groups have expressed a desire for increased consultations with DFO and communication on WSP implementation. There are two key challenges for DFO in further implementing this WSP principle:

- Many Aboriginal groups need to develop their financial, technical, and scientific capacity to fully engage in WSP implementation.
- DFO has not finalized a national information management system and approach to collecting and sharing Aboriginal Traditional Knowledge (ATK) and consultation results.

2.3. Principle 3: Sustainable Use

DFO is committed to ensuring that resource management decisions consider biological, social, and economic consequences, reflect best science including ATK, and maintain the potential for future generations to meet their needs and aspirations.

In support of this principle, current resource management practices consider biological information through:

- Pre-season forecasts and the *Salmon Outlook*,[8]
- In-season stock assessment and re-forecasting of run sizes using information gained from test fisheries, catch monitoring programs and escapement surveys,
- Post-season evaluations that review estimates of total run size, harvest rates, catches, fishing effort, escapement and other factors used to assess whether escapement goals and other management objectives have been met. and

While the above measures are in place to ensure that the best science is available for resource management decisions, there is a need to improve information on catch levels, both in terms of accuracy and composition of the catch.

Additional evidence of how biological consequences are considered by resource managers includes:

- Escapement targets for chum on the Yukon River are based on maximum sustainable yield (MSY).
- WCVI chinook have been identified as a stock of concern. To minimize impacts to this stock and also allow fish harvesters to meet some of their aspirations, DFO has reduced the harvest rate and conducts in-season monitoring, using DNA analysis of the North Coast commercial troll fisheries.

[7] An *Allocation Policy for Pacific Salmon* can be found on-line at: http://www.dfo-mpo.gc.ca/Library/240366.htm.
[8] Since 2002, Pacific & Yukon Region, Stock Assessment staff have provided a categorical outlook for the next year's salmon status. The *Salmon Outlook* is intended to provide an objective and consistent context within which to initiate fisheries planning. In particular, it provides a preliminary indication of salmon production and associated fishing opportunities by geographic area and species (a stock group). While ocean conditions have shown some improvement, it is not possible to predict changes to specific stocks with any certainty. The most current *Salmon Outlook* (2009) can be found on-line at: http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/webdocs/SalmonStockOutlook2009.htm

- Transition away from traditional, large mixed stock fisheries and towards more terminal fisheries that can better target harvesting efforts to avoid the weaker sub-populations within salmon runs, e.g., PICFI project involving terminal fisheries on Kamloops Lake.
- PICFI project to develop a biophysical model for the movement of fish from the marine environment to the Fraser River.
- Further diversification of harvest methods, e.g., encouraging dry-rack and dip-net fishing on the Fraser River.

A number of policy initiatives and directives have been launched that support the WSP principle of sustainable use of the resource. *Pacific Fisheries Reform*, announced by the Department in April of 2005, provides a vision of a sustainable fishery where the full potential of the resource is realized, Aboriginal rights and title are respected, there is certainty and stability for all, and fishery participants share in the responsibility of management. This policy direction provides a framework for improving the economic viability of commercial fisheries and addressing First Nations aspirations with respect to FSC and commercial access and involvement in management to support a sustainable fishery.

In addition, the *General Fishery Decision-making Framework*[9] provides guidance on incorporating the Precautionary Approach into harvest strategies to ensure sustainable use of the resource. Within this Framework, the Department will identify reference points and stock status zones which are defined by critical, upper stock and cautious reference points. Based on these reference points, the DFO develops harvest strategies and decision rules that take into account risk and uncertainty. The Upper Stock Reference point is determined by considering productivity objectives for the stock, broader biological considerations and social and economic objectives for the fishery.

The WSP advocates a similar approach as the General Fishery Decision-making Framework, except that the WSP clearly separates scientific from social and economic information. Biological status zones for individual Conservation Units are differentiated based on biologically based benchmarks in Strategy 1. This information is used, along with information on the status of the habitat (Strategy 2) and ecosystem (Strategy 3) in the articulation of harvest strategies and decision rules following incorporation of socio-economic information in Strategy 4.

Resource Managers discuss socio-economic goals with stakeholders and First Nations, and include First Nation, Commercial and Recreational objectives for the fishery in the Integrated Fisheries Management Plan (IFMP).[10] For example, Section 4 of the current Salmon IFMP for Southern BC, identifies *manage fisheries for sustainable benefits consistent with established policies* as a key objective for the fishery. In the commercial fishery, this objective is defined as improving *the economic performance of fisheries, to provide certainty to participants, and to optimize harvest opportunities*.

To meet this objective, the Department is moving away from the current allocation system[11] to a more effective share based management system for commercial salmon. In moving forward, the DFO has

[9] The *General Fishery Decision-making Framework* can be found on-line at: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm.

[10] The IFMP is a document that sets out a number of things including the policy framework, key objectives of the fishery, general (and in some cases specific) decision rules and an anticipated fishing plan for that particular species.

[11] Currently, the available commercial harvest is estimated during the annual IFMP process. After conservation and First Nations FSC needs are accounted for, the remaining available harvest is divided between the recreational and commercial fisheries according to the *Allocation Policy for Pacific Salmon.* The *Allocation Policy* establishes a target sharing arrangement between the established gear types in the fishery (gillnet, seine and troll). This target sharing arrangement applies on a coast-wide basis to all five species of salmon by converting the available catch of all species into "sockeye equivalent units" based on their current landed value (37 percent gillnet / 40 percent seine / 23 percent troll). This allocation model does not provide the certainty and security required by commercial harvesters to efficiently plan their fishing operations or sufficient flexibility to address the changing needs of the resource and society without significant conflict and controversy.

encouraged interested and willing commercial fleets and First Nations to propose demonstration fisheries.[12] Demonstration fisheries test a range of alternative share based management approaches with respect to their technical feasibility, their contribution to improved resource sustainability and economic viability as well as their potential contribution to more transparent transfer of commercial access to First Nations. The complexity of salmon biology and the nature of commercial salmon fishing make it difficult to implement and apply a standardized "one size fits all" approach to share based management of commercial salmon fishing.

Projects that DFO is undertaking to consider the social and economic consequences of resource management decisions include:

- A project that considers both biological and social economic information in a model for movement of fish from marine back into Fraser.
- Barkley Sound economic indicators project
- Exploring the harvest of other species with First Nations to reduce the pressure on certain salmon stocks, for example the Department has encouraged First Nations to harvest pink rather than sockeye salmon.

Beginning in 2010-2011, DFO will be using the new IFMP template for salmon. The new template provides an overview of stock assessment, science, Traditional Knowledge, economic conditions and social, cultural and economic issues of the fishery. This will ensure that decision-makers are informed about biological and socio-economic implications related to stock conservation and sustainable use.

2.4. Principle 4: Open Process

Under WSP and the *Consultation Framework*[13] DFO is committed to ensuring that resource management decisions are made in an open, transparent, and inclusive manner. To meet its commitment, DFO:

- Engages advisors and harvesters in the development of the three salmon IFMPs[14] through the following annual process:
  - Pre-season phase, which involves the release of the Salmon Stock Outlook and discussion of stock status, any new analytical approaches, policy revisions, license conditions, decision guidelines, and specific actions. This phase involves at minimum one open meeting with the advisory group, First Nations, and harvesters.
  - The initial "draft" IFMP is released for general comment approximately 3 months prior to the start of the fishery. Then meetings are held between DFO and single harvesting sectors. Approximately 6 weeks prior to the start of the fishery, a "near final" plan is released to the Integrated Harvest Planning Committee (IHPC) prior to review by the Minister. The final IFMP released by the Minister is the final decision on many of the issues.[15]
  - In-season management phase, during which biologists and managers monitor the progress of the fisheries and the status of stocks. Weekly meetings/ phone calls are held between

[12] For an overview report on eight salmon demonstration fishery projects from between 2005-2007, go to: http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/pol/docs/2008-demo-rep-rapp.pdf

[13] Under the *Consultation Framework* (2004), DFO is obligated *to undertake consultations in order to improve departmental decision-making processes, promote understanding of fisheries, oceans and marine transport issues, and strengthen relationships.* The Framework can be viewed on line at: http://www.dfo-mpo.gc.ca/Library/282187.pdf

[14] Information on salmon consultations, including terms of reference, membership, meeting dates and records of consultation can be found on the Salmon Consultation website at: http://www.pac.dfo-mpo.gc.ca/consultation/fisheries-peche/smon/ihpc-cpip/index-eng.htm

[15] The Salmon IFMPs can be viewed on line at: http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/MPlans.htm#Salmon

DFO and advisory group representatives to review the stock status and recommend fishing patterns.
    - Post-season phase, involves the review the performance of the fishery relative to the plan including determining if escapement objectives were achieved and identification of management issues that need to be addressed prior to the next season. The post-season reviews are conducted with the full range of advisory bodies applicable to the fishery under consideration.
- Regularly posts salmon information, including in-season run size estimates and management actions, such as openings and closures, and other important information for fisheries on the Internet throughout the fishing season at: www.psc.org/news_frpnews.htm. Additionally, specific Fishery Notices are posted at: http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/fns/index.cfm?pg=search_options&lang=en&ID=commercial.
- Conducts a peer review process that serves as a forum to challenge and review scientific information and addresses a number of scientific questions related to the management of oceans and the conservation of marine and freshwater resources through the Canadian Science Advisory Secretariat (CSAS)[16]. Knowledgeable individuals (participants are not advocates or representatives for any interest group) are invited to participate in peer review meetings and express partisan views on science issues and management decisions. Due weight is given to the 'traditional knowledge' of local peoples.
- Pacific Salmon Commission panel and Commission processes are open to the public and are transparent. These processes underlie many of the Department's salmon management decisions.
- Participates in local watershed roundtables. Roundtables may involve stewardship groups, stakeholder groups (e.g., BC Cattleman's Association, Placer Mines Association, White Valley Community Association), college and university students, homeowners, First Nations, and municipal, regional district, and provincial representatives. Some examples of watershed roundtables are: Lake Else roundtable, Cowichan roundtable, Nootka Roundtable, Kitwanga roundtable, Barkley Sound Initiative, Skeena Watershed Initiative, Chum and Chinook Conuma Roundtable, and Clayquot Sound Roundtable.
- Invites scientists from within and outside DFO to participate in meetings of the Fisheries Oceanography Working Group. Annual publications of this group (http://www.pac.dfo-mpo.gc.ca/science/psarc-ceesp/osrs/index-eng.htm) include descriptions of research investigating ways to better incorporate oceanographic and climatic information into predictions of salmon survival and abundance.

The Department also underwent extensive public consultation in the development[17] and on-going implementation of the WSP. Since DFO approved the Policy in 2005, the Department has undertaken many consultations on all aspects of WSP implementation (refer to Appendix X for a detailed list of consultations to date).

2.5. Objective 1: Safeguard the Genetic Diversity

DFO will maintain genetic diversity of Pacific salmon through the protection of *Conservation Units* (CUs). Maintaining CUs requires protecting populations and demes, but not necessarily all of them, all of the time. In determining how much diversity to protect, DFO aligned its objectives within the WSP with

[16] The Canadian Science Advisory Secretariat (CSAS) can be found at: http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm
[17] Detailed records for DFO's consultation on the draft policy in 2004 consultations were compiled and are available upon request through the Consultation Secretariat. A summary of 2005 fall consultations, including WSP implementation is available at http://www.dfo-mpo.gc.ca/Library/320150.pdf.

those specified in Canada's *Species at Risk Act* (SARA) as much as practicable.[18] CUs were intended to conform to the to the minimum species unit under SARA, and the lower benchmark was set at a level high enough to ensure a substantial buffer between it and when the CU might be considered at risk of extinction. Maintaining healthy abundances within CUs requires sufficient spawning salmon to re-colonize depleted spawning areas and protection of fish habitat to support production and provide connection between localized spawning groups. While it is the clear intent of this policy to prevent losses resulting from management and use, it is unrealistic in natural environments to expect all losses can be avoided, such as losses resulting from natural disasters or catastrophic events.

[Waiting for information from Ruth Withler/Neil Schubert on this Objective]

To maintain salmon diversity, DFO links stock assessment and harvest management strategies. Science informs resource managers on the consequences of harvesting and management actions on the biological status of salmon. Resource managers have adopted the Department's general fishery decision-making framework for implementing a harvest strategy that incorporates the Precautionary Approach.[19] This approach involves identifying and prioritizing fisheries management goals, developing, and evaluating the full range of available management options in consultation with First Nations, local community groups, and other fishery stakeholders including nongovernmental environmental organizations. Engaging these various interests throughout the planning process - from the establishment of planning priorities through to the evaluation and selection of the preferred management alternative - helps build consensus on the most appropriate management approach and facilitates improved understanding of the final management decisions.

Please refer to Strategy 1 for more information and implementation to date. Some examples of where DFO has attempted to safeguard the genetic diversity of wild Pacific salmon in the absence of CUs are:

- The general approach to introductions and transfers does not allow for transfers between CUs (e.g., hatchery in Whitehorse, no pink salmon in non-natal streams, net pens were not allowed in Sidney harbour, and Omega Pacific was not authorized to introduce yearling chinook smolts into Robertson creek as a precautionary approach), natal streams are the first choice of broodstock for rebuilding programs to retain local adaptations, and the nearest, best matched systems are the first choice for sourcing transfers or introductions.
- DFO enhancement activities consider three potential interactions with wild stocks: high target exploitation rates on wild stocks due to abundant hatchery stocks, competition for available food sources, and maintenance of genetic diversity. Mechanisms are in place to try to address these potential interactions:
  - Exploitation rates are constrained to be sustainable for less productive stocks in mixed stock fisheries, and abundant stocks are fished terminally.
  - Juvenile interactions in freshwater are managed through release strategies that either minimize freshwater residency periods or take into account juvenile carrying capacity. Marine carrying capacity is unknown, but SEP is beginning to work with DFO Science on Ecosystem Research Initiatives to support our understanding of marine carrying capacity.
- Management to avoid excessive harvest of vulnerable CUs considers genetic information (DNA testing undertaken by the PSC) to determine their presence in a given fishery. However, the resources to analyze the DNA samples being collected are unavailable.

[18] Irvine, J. R. and G. A. Fraser. 2008. Canada's Wild Pacific Policy and the Maintenance of Diversity. American Fisheries Society Symposium 49:391-398.
[19] For more information, go to: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm

- Escapement target and fishery timing window on Nass CUs consider harvest and spawning requirements, with total estimates of returns to Canada determined by a fish wheel/mark recapture program.
- Genetics is considered in the recovery strategies for Cultus Lake and Sakinaw Lake sockeye.
- On Yukon River, DFO has completed studies to understand the effects of net selectivity and impacts of removing large fish from the system.

2.6. Objective 2: Maintain Habitat and Ecosystem Integrity

Identifying, protecting, restoring and rehabilitating aquatic habitats are critical to maintaining their integrity and sustaining ecosystems. The WSP commits the Department to move beyond the 1986, DFO's Habitat Management Program (HMP) and its project-by-project review, mainly in freshwater environments. DFO's new approach to habitat management should focus on:

- Making greater use of indicators to assess and monitor the health of freshwater and marine habitat.
- Salmon habitat that is most productive, limiting, or at risk in a CU to clarify decision-making.
- Better linking habitat management strategies to harvest and salmon assessment (Strategy 4).
- Addressing low risk activities, where measures to avoid or mitigate impacts are well understood, through guidelines and standards.
- Using Pacific Council of Fisheries and Aquaculture (PFAC) to provide a collaborative approach between DFO, the Province of BC, and the Yukon Territorial Government so that land and water use activities and decisions better support the needs of salmon.

Some examples of where DFO has made progress on meeting this objective include:

- The Environmental Protection Modernization Plan introduced 6 program elements to improve program delivery:
  - Habitat Compliance Modernization (HCM)(12 FTEs for Pacific Region)
  - Improved management of major projects (MPMO) (11 FTEs for Pacific Region)
  - Guidelines and standards for low risk activities.
- Wild salmon status is one of the key consideration when doing authorizations.
- PSARC paper on escapement goals for the Alesk using Bayesian analysis and considering habitat???
- The WSP has been a topic of discussion at four PFAC meetings.[20] Additionally, habitat management was identified as an area in need of better coordination and direction from Ministers (streamlining federal/provincial regulations and establishing standards). As such, PFAC has drafted terms of reference for a Director's level PCFAM Habitat Management Task Group.
- Watershed planning efforts in Chilliwack, Lake Else, and on Shuswap Lake consider the salmon habitat as productive and/or limiting.
- Skeena Watershed initiative habitat sub-committee is identifying important habitat for salmon and key threats.
- Biometrics undertaken by SEP helping to determine system carrying capacities.
- Ecosystem considerations being considered in habitat work and flood control, e.g., Adams River channel diversion, encouraging natural flood control in the Cowichan.

[20] March 11, 2005 (PFAC-BC/YT); December 3, 2008 (PFAC-BC/YT); October 23, 2009 (PFAC-BC); and April 30, 2010 (PFAC-BC)

- Regional Referral Prioritization Decision-making Framework – how does WSP fit with this (p 22)
- New PSC Habitat and Restoration Technical Committee demonstrate consideration of ecosystem factors.
- Province's Water Act Modernization process.

Refer to Action Step 2.1-2.4 for more information on the development and use of habitat indicators and to Action Step 4.1-4.2 for more information about linking habitat management strategies to harvest and salmon assessment.

Unprecedented resource development in the Pacific Region has stretched the HMP's capacity. Focus is on mandated priorities and the use of partnerships or other approaches to enhance program delivery. Habitat work is centred around regulatory decisions. Any decisions related to wild salmon habitat there is an emphasis on protecting habitat for wild salmon. DFO applies the habitat risk management framework and standard operating policies manual (May 2006) to any regulatory decision.

Progress towards maintaining habitat and ecosystem integrity will depend on the support and participation of other levels of government with relevant jurisdictions. For example, to address impacts to habitat and address growing development pressure, the Department will need to engage First Nations, local governments, the Province of BC and the Yukon Territorial Government. Furthermore, success towards achieving habitat and ecosystem integrity will depend on the engagement of internal programs, including the SEP Resource Restoration Unit and Community Advisors, as well as external interest groups. such as Pacific Streamkeepers and Salmonid Enhancement Advisory Board.

2.7. Objective 3: Manage Fisheries for Sustainable Benefits

The third objective of WSP is to safeguard the genetic diversity of salmon while accounting for and providing sustainable harvesting opportunities that will best meet the Department's obligations to First Nations, and contribute to other economic benefits to individuals and fisheries-dependent communities. This requires structured processes that: (1) establish specific objectives and priorities, and (2) allows the biological, social, and economic consequences of different conservation measures and activities to be considered and weighed in an open and transparent way. First Nations, harvesters, environmental groups, and community interests in the resource need to be engaged directly in these processes, and in the determination of the most appropriate management actions.

Refer to information under Principles 1-3 and Action Steps 4.1 and 4.2 for more information about how the Department is meeting this objective.

Escapement objectives largely ignore any consideration of salmon and ecosystem interactions. Knowledge base on ecosystem indicators is insufficient for prescriptive actions other than a generally "precautionary" stance. There needs to be discussion between Science and Fish Management to determine the difference between biological and management lower benchmarks and how they should be applied.

Terminal vs. mixed-stock fishery policy??

2.8. Strategy 1: Standardized Monitoring of Salmon Status

Strategy 1 outlines a process to systematically organize all Pacific salmon streams and lakes into geographic units for conservation and specification of the means to monitor abundance and distribution of Pacific salmon within those units over time. The WSP identifies three steps for implementing Strategy 1:

1. Identify Conservation Units (CU's)
2. Develop criteria to assess CUs and identify benchmarks to represent biological status
3. Monitor and assess status of CUs

2.8.1. Identify Conservation Units

Identify Conservation Units (CU's) based on aggregate freshwater habitats. The number of CUs for each species is function of the DFO's knowledge base and is expected to change over time.

2.8.1.1. Progress to Date

DFO collaborated with the Nature Conservancy of Canada to develop a method to identify the CU's for the five species of Pacific salmon in British Columbia.[21] The method characterizes diversity of Pacific salmon along three major axes: ecology, life history, and molecular genetics, and then to compartmentalize that diversity into CU's. Currently, there are 47 chum, 79 chinook, 46 coho, 32 pink, and 257 sockeye (24 river and 233 lake) CU's defined in BC and the Yukon.

2.8.1.2. Implementation Gaps and Next Steps

The next steps in implementing action step 1.2 are consulting and finalizing Yukon CU's and the development a process, including timelines and accountabilities for revising the number of CU's.

2.8.2. Criteria to Assess CUs and Identify Benchmarks

Develop criteria to assess CUs and identify benchmarks to represent biological status. The biological status of a CU should be based on the abundance and distribution of spawners in the unit, or proxies thereof. If a CU contains more than one population, distribution of abundance among the populations needs to be determined. For each CU, higher and lower benchmarks that will delimit three status zones: Green, Amber, and Red needs to be defined. Changes in status will initiate management actions. The specific management actions will vary among species, geographic regions, and cause of the decline and will be determined through the integrated planning process described in Strategy 4. Within the Red zone, there will be a level of abundance that cannot sustain further mortalities, operational guidelines will be prepared and published on the estimation of this level.

2.8.2.1. Progress to Date

The Department has identified quantifiable metrics of biological status and candidate benchmarks along those metrics to allow for future CU assessments using Takla/Trembleur sockeye salmon (Early Stuart run-timing group of the Fraser River) and Hecate Strait Lowlands pink salmon (odd year).[22] The approach is based on current abundances, trends in abundance over time, distribution of spawners, and fishing mortality relative to stock productivity. Currently, the DFO is developing a software tool to estimate benchmarks for CUs using example data from spawner and recruitment data. The tool will help experts evaluate benchmarks on several metrics of status, which can then be used to identify green, red, or amber zones for each CU for those metrics.

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[21] CSAS 2007/070 - Conservation Units for Pacific Salmon under the Wild Salmon Policy, By L. Blair Holtby and Kristine A. Ciruna, http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2007/2007_070-eng.htm

[22] CSAS 2009/046 - Workshop on methods for assessing status and identifying benchmarks for Conservation Units of the Wild Salmon Policy, January 5-6, 2009, http://www.dfo-mpo.gc.ca/csas-sccs/publications/pro-cr/2009/2009_046-eng.htm; CSAS 2009/055 - Framework for implementation of the Wild Salmon Policy: Initial lists of Conservation Units for British Columbia, http://www.dfo-mpo.gc.ca/csas-sccs/publications/sar-as/2009/2009_055-eng.htm; CSAS 2009/058 - Holt, C., Cass, A., Holtby, B., and Riddell, B. 2009. Indicators of Status and Benchmarks for Conservation Units in Canada's Wild Salmon Policy, http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2009/2009_058-eng.htm; CSAS 2009/059 - Holt, C. 2009. Evaluation of Benchmarks for Conservation Units in Canada's Wild Salmon Policy: Technical Documentation, http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2009/2009_059-eng.htm; and Technical report on metrics distribution completed: Peacock, S., and Holt, C. 2010. A review of metrics of distribution with application to Conservation Units under Canada's Wild Salmon Policy)

Using the method that DFO developed, abundance benchmarks (unique benchmarks for each CU with stock-recruitment data) were estimated and trends in abundance upper and lower benchmarks (identical benchmarks for all CUs) were modified for 26 Fraser sockeye CUs.[23] These benchmarks delineate three biological status zones (Green, Amber, Red) for Fraser sockeye.

2.8.2.2. Implementation Gaps and Next Steps

Over 400 CUs still require development of benchmarks. The DFO also has not combined the status from each metric into an overall, single measure of status for each CU, however, discussions have taken place with DFO staff and external experts on this matter.

Fraser sockeye CU benchmarks only estimated abundance and trends in abundance indicators. Artifacts of data collection methods often preclude the ability to track true distributional trends other than on a course scale for most systems. If these indicators of stock status are to be used in the future they will require considerable input from the programs currently monitoring and evaluating Fraser sockeye abundance in the Fraser watershed and will also require linkages with habitat indicators. Fishing mortality benchmarks, since they are not intrinsic properties of the CU, may not be specifically required in evaluating CU status, even when consensus on benchmarks for this class of indicator is reached. This class of indicator, however, might be appropriate for characterizing threats to CUs when information on abundances are not available.

2.8.3. Monitor and Assess Status of CU's

For each CU, a statistically based and cost effective monitoring plan will be designed and will build on existing programs and local partnerships. Monitoring programs must assess the annual abundance of the CU and the distribution of spawners.

2.8.3.1. Progress to Date

Currently, Stock Assessment Division (StAD) develops an annual Salmon Outlook, which provides an evaluation of the expected status of aggregates of salmon populations. The most recent Nass sockeye stock status paper that was peer reviewed used CUs.

Additionally, preliminary assessment frameworks (AFs) have been completed for coho CUs, Fraser sockeye, and all species in the North Coast. A draft Stock Assessment Framework that is tied into the fisheries management framework and provides guidance on how to determine the level of monitoring programs in the assessment has been developed. A synoptic review methodology that determines the status of CU's where there is data has been drafted.

2.8.3.2. Implementation Gaps and Next Steps

Concerning next steps, fisheries management plans, stock status assessments, and assessment frameworks (e.g. stock groupings used for harvest planning) need to consider WSP requirements, such as CU definitions and status. Once finalized, assessment frameworks will outline steps to assess the annual abundance of the CU and distribution of spawners for 461 CUs. The Salmon Outlook will need to be revised to adopt the CU methodology. The Department could be engaging stewardship groups and industry (e.g., run-of-the-river projects) to develop and gather data for the stock assessment framework. Another option could be better linking the Aboriginal Fisheries Strategy (AFS) program to monitoring and assessing the status of CUs.

[23] The list of Fraser sockeye CU's has been revised to include only 36 CU's, 10 of which require further refining. However, benchmarks have only been defined for 26 of the Fraser Sockeye CUs.

A second challenge will be evaluating the status of CUs for which there is little or no information (30-50 percent of CUs have no data to do even rudimentary assessments). Although these CUs are largely in areas not impacted by commercial fisheries, any habitat and ecosystem integrity issues remain largely unaddressed. One possible approach to addressing this challenge is to integrate information across neighbouring CUs that are believed to have similar dynamics, responses to stressors, and status.

A catch monitoring policy could be advanced more with stakeholders. Identify the budgetary and operational requirements for monitoring the status of all CUs.

2.9. Strategy 2: Assessment of Habitat Status

Strategy 2 requires an overview of important habitat and habitat issues within CUs and assessment of habitat status using indicators that combine scientific and local knowledge and recognize sensitive life stages and habitats. Indicators will reflect overall habitat health and be tracked to assist in habitat planning. The WSP identifies four steps for implementing Strategy 2:

1. Document habitat characteristics within CUs
2. Select indicators and develop benchmarks for habitat assessment
3. Monitor and assess habitat status
4. Establish linkages to develop an integrated data system for watershed management

2.9.1. Document habitat characteristics within CUs

An overview report will be prepared for each CU that provides sufficient information on key habitats to identify initial priorities for protection, rehabilitation, and restoration. It will also identify information gaps and factors, such as water quality and quantity that potentially threaten the future health and productivity of habitats in the CU.

2.9.1.1. Progress to Date

DFO has developed a two-level approach to documenting habitat characteristics for CUs. The CU overview reports are intended to provide a very coarse filter for identifying general habitat status, landscape threats and trends. The second tier, is a more detailed watershed scale habitat status report which provides information on locations and status of highly productive and limiting habitats and local threats or pressures to habitats which can inform local habitat conservation, restoration and enhancement efforts and can also support integrated planning processes where these exist. Published and unpublished data and information including internal DFO staff knowledge, local ecological knowledge and aboriginal traditional knowledge is used to inform these habitat status reports.

DFO piloted habitat status reporting in nine CU's across Pacific Region[24] and then subsequently completed more detailed habitat status templates and reports for the Sarita (Barkley Sound), Lower Harrison River, and Cowichan River. Several more status reports for the San Juan, Bedwell, and Somass (Barkley Sound) watersheds are under development this year.

2.9.1.2. Implementation Gaps and Next Steps

There have been no overview reports finalized for any CUs. This may be attributed to the fact that priority CUs have not been identified and the lack of a habitat monitoring framework that outlines a process for selecting representative watersheds within CUs for monitoring habitat health and tracking habitat status.

[24] Lower Thompson Spring chinook (4, 2s), Trembleur Lake sockeye, Lower Fraser fall white chinook, Cultus sockeye, Fraser chum, South and Vancouver Island summer chinook, Central West Coast Vancouver Island chinook, East Coast Vancouver Island coho, south/north even year pinks, Porcupine coho, and Yukon mainstem chum

The habitat status template reports that have been developed are to be completed using existing information and local expert opinion. They do not include new data compilation or analyses (ie: limiting factor analyses or productive capacity estimates). Additionally, the HMP role in the collection and analysis of habitat status and health data for WSP implementation is not funded nationally.

Many regional districts,[25] municipalities and stewardship/ environmental groups have developed detailed habitat restoration plans and expressed an interest in collecting data on habitat health. The Strategy 2 lead will engage stewardship groups and First Nations in discussions regarding their contributions to watershed scale habitat status and CU scale habitat overview reports.

The BC Water Act Modernization initiative provides a prime opportunity for Canada and BC to integrate WSP objectives into an affordable and informative framework that will meet the requirements of a new BC *Water Act*, and serve to support the objectives of the federal *Fisheries* and *Species at Risk* Acts as well as WSP particularly as it relates to development of common objectives and a suite of aquatic ecosystem health indicators.

2.9.2. Select Indicators and Develop Benchmarks for Habitat Assessment

Indicators and benchmarks for CUs on a watershed scale will be selected to assess the quantity and quality of the habitats identified in the overview report.

2.9.2.1. Progress to Date

DFO has identified a two-tiered list of habitat indicators, benchmarks, and metrics for streams, lakes, and estuaries using a two-tiered approach.[26] The first tier looks at pressure indicators to assess factors that force environmental change (e.g. land conversion, water abstraction). The second tier are status indicators that describe the condition of the local habitat, such as water temperature, sediment load, and stream discharge.

2.9.2.2. Implementation Gaps and Next Steps

Identification of appropriate habitat state and pressure indicators based on threats and limiting factors analyses in habitat status reports to establish a geographically relevant suite of indicators for subsequent health and status monitoring. To fulfil this gap, the DFO needs to confirm data sources for habitat quality and quantity, joint initiatives (with Environment Canada, BC-MOE, etc.) for monitoring, tool that could be marketed and linked in to other groups systems, and funding from the national HMP.

2.9.3. Monitor and Assess Habitat Status

Based on the CU framework (overview report, indicators and benchmarks), ongoing habitat monitoring framework will be implemented to identify changes in habitat condition over time under the WSP with broader ecosystem monitoring conducted by DFO and other agencies.

2.9.3.1. Progress to Date

Piloted sub-set of indicators over approximately twenty sub-basins in Lower Thompson coho CU.

Series of Pacific Salmon Life History Requirements documented by Ron Diewart.

[25] DFO staff are working with regional districts in Puntledge, Englishman River, Cowichan and Somass to determine habitat status.

[26] Canadian Manuscript Reports of Fisheries and Aquatic Sciences: Stalberg, H.C.; Lauzier, R.B.; MacIsaac, E.A.; Porter, M.; Murray, C. 2009. Canada. Dept. of Fisheries and Oceans. Pacific Region. Oceans, Habitat and Enhancement Branch, *Canada's Policy for Conservation of Wild Pacific Salmon: Stream, Lake, and Estuarine Habitat Indicators*. http://www.dfo-mpo.gc.ca/Library/338996.pdf

A framework for selecting watersheds in large CUs for both habitat status reporting and monitoring is under development.

2.9.3.2. Implementation Gaps and Next Steps

A habitat health, integrity, and status monitoring framework, as well as sampling protocols, standards and development of monitoring databases that would be integrated with Strategy 1-4 and identified representative watersheds within each CU.

Collection and monitoring of environmental habitat status indicator information is not currently a mandate of the National Fish Habitat program. DFO habitat monitoring efforts are focussed on project specific compliance and conformance monitoring with DFO approval conditions. The program does not currently include environmental monitoring. Development, collection, and monitoring work are costly and an explicit budget is needed to continue progress. WSP Strategy 2 implementation has been identified by the Region as a funding pressure to NHQ every year since 2005.

Although DFO does not have a national mandate for habitat health monitoring of CUs, the WSP has created an expectation, that DFO will be able to gather and analyze habitat health data to identify changes to habitat condition over time. Currently, DFO Science and Habitat need to build their capacity to meet these obligations within a freshwater ecosystems context.

2.9.4. Integrated Data System for Watershed Management

Together with the Province of British Columbia and other partners, DFO will promote the design, implementation, and maintenance of a linked, collaborative system to increase access to information on fish habitat status.

2.9.4.1. Progress to Date

DFO developed a WSP web-mapping application that stores and provides common access to data. The application is linked to other open standard GIS data sources and could provide one-window access to WSP data. DFO staff have been in discussions with other agencies who have relevant information management systems, such as the Province of BC's *Hectares BC* and the Aquatic Information Partnership project (funded by the Fraser Salmon & Watersheds Program,) to ensure linkages with the WSP web-mapping application.

2.9.4.2. Implementation Gaps and Next Steps

Ongoing maintenance and support of the WSP web-mapping application (data uploads, server maintenance and system enhancements) has been a challenge as ownership needs to be cross-sector. Additionally, there is a lack of consensus on the scope and potential of the web mapping application to provide an integrated data management system for planning as envisioned under Strategy 4. Further work is also required to increase awareness and understanding amongst internal staff and external interest groups on the use of the web-mapping application as an information access tool.

2.10. Strategy 3: Inclusion of Ecosystem Values and Monitoring

The Department's intent is to progressively consider ecosystem values in salmon management, but the policy acknowledges a limited ability to do so at the present time. The WSP identifies two elements for implementing Strategy 3:

- Identify indicators to monitor status of freshwater ecosystems
- Integrate climate and ocean information into annual salmon management processes

2.10.1. Indicators to Monitor Status of Freshwater Ecosystems

The DFO will use existing data and expert advice to identify key indicators (biological, physical, and chemical) of the current and potential state of lake and stream ecosystems (diversity of organisms, rates of biological production, etc.). Within two years, an ecosystem monitoring and assessment approach will be developed, and integrated with ongoing assessments and reporting on the status of wild salmon.

2.10.1.1. Progress to Date

After public consultations in 2007 and 2008, in October 2009, DFO Operations Committee approved a conceptual framework for ecosystem-based indicators[27] and supported for further testing and refinement as part of the Barkley Sound WSP implementation initiative (refer to section on the Barkley Sound pilot for more information).

The Department has also developed Fish-and-Water Management Tools (FWMT) decision support system.[28] FWMT is a coupled-set of four biophysical models of key relationships among climate, salmon and water that interact with a 5th water-management rules model used to predict consequences of water management decisions for fish and other water users. FWMT-Okanagan provides an informative and affordable ecosystem-based, fish-and-water management framework complete with clear objectives and a suite of biophysical indicators (i.e., FWMT integrates biophysical processes, deals with multiple species and geographic locations, and anticipates socio-economic outcomes of decisions). It has been adopted by DFO, BC and the Okanagan Nation Alliance as the basis for joint fish-and-water management decisions in the south Okanagan.

2.10.1.2. Implementation Gaps and Next Steps

The DFO has not finalized ecosystem indicators (biological, physical, and chemical) for the current and potential state of lake and stream ecosystems (diversity of organisms, rates of biological production, etc.) based on existing data and expert advice. However, a discussion paper with proposed ecosystem objectives, indicators, benchmarks, and management options is currently being assembled by a DFO working group and will be scheduled for scientific review in 2010. There are many cross-sectoral and cross-agency opportunities to develop ecosystem based indicators and broader management approaches to meet WSP, such as West Coast Aquatic (Okey-Toft) and others (Ruckleshaus-NMFS). The current Climate Impact Adaptation Memorandum to Cabinet could highlight the importance of meeting these integrated challenges.

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[27] There have been several background papers on ecosystem-based indicators developed, including: M.A. Branton, M.M. Manson, R.V. Galbraith. *Application of the Canadian aquatic bio-monitoring network and reference condition approach to Canada's Pacific Wild Salmon Policy.* Vancouver, B.C.: Fisheries and Oceans Canada, Oceans. http://www.dfo-mpo.gc.ca/Library/326928.pdf; CSAS 2770 - Nelitz, M.; Murray, C.; Porter, M.; Marmorek, D.R. *Managing Pacific salmon for ecosystem values : ecosystem indicators and the wild salmon policy.* Vancouver, B.C.: Pacific Fisheries Resource Conservation Council, 2006. http://www.fish.bc.ca/files/reports/EcosystemIndicators_2006_0_Complete%20for%20web.pdf; Pacific Fisheries Resource Conservation Council. *Advisory: implementing the habitat and ecosystem components of DFO's wild salmon policy*. Vancouver, BC: The Council, 2006. http://www.fish.bc.ca/files/reports/R-42%20Advisory-DFOWildSalmonPolicy_2006_0_Complete.pdf; and Hyatt, K.D. *Ecosystem considerations for the development of biological reference points and future implementation of Fisheries and Oceans Canada's wild salmon policy*. Copenhagen: The International Council for the Exploration of the Sea, 2001. (CATNO: 264822)

[28] Five reports on development and use of the FWMT-DSS and freshwater ecosystem objectives and indicators models published to date including: Hyatt, K. D. and C. Bull. 2007. *Fish and Water Management Tool project assessments: Record of management strategy and decisions for 2005*. Can. Ms. Rep. Fish. Aquat. Sci. No. 2808, 37p. (http://www.dfo-mpo.gc.ca/Library/331623.pdf); Alexander, C. A. D, K. D. Hyatt and B. Symonds. 2008. *The Okanagan Fish/Water Management Tool: Guidelines for Apprentice Water Managers.* V.2.1.000, 127 p.; Hyatt, K. D., C. Bull and M. M. Stockwell. 2009. *Okanagan fish and water management tool project assessments: Record of management strategy and decisions for the 2005-2006 fish-and-water year*. (http://www.dfo-mpo.gc.ca/Library/338999.pdf) Can. Ms. Rep. Fish. Aquat. Sci. No. 2897, 68p.; Hyatt, K. D. and M. M. Stockwell. 2010. *Okanagan fish and water management tool project assessments: Record of management strategy and decisions for the 2006-2007 fish-and-water year*. Can. Ms. Rep. Fish. Aquat. Sci. No. 2913, 65p. (http://www.dfo-mpo.gc.ca/Library/340594.pdf); and Summit Environmental Consultants. 2010. *Summary Report prepared for the Okanagan Basin Water Board (OBWB), Kelowna, BC, Okanagan Water Supply and Demand Project: Phase 2*, 82p. plus 15 Appendices on CD.

Additionally, the DFO could use a similar approach to the FWMT initiative to integrate CU, habitat and ecosystem objectives, and indicators into an informative and affordable framework for monitoring and evaluating natural and human-induced impacts on CUs within a freshwater and marine ecosystems context.

DFO Habitat, FAM, and Science sectors lack the capacity to address the new WSP requirement to address wild salmon issues in a freshwater ecosystems context. Currently, Science is focused on monitoring and evaluation of the state of ocean ecosystem structure and processes. FAM is focused on implementing the current IFMP process, and Habitat is focused on implementing the National Habitat Policy. As such, DFO does not collect and analyse information to inform ecosystem-based indicators, such as stream discharge, lake levels, land-use histories, water temperature, forest cover, road networks, resource extraction records, data, etc.

2.10.2. Integrate Climate and Ocean Information

2.10.2.1. Progress to Date

Several scientific and research papers have been drafted that contemplate ecosystem indicators and/or methods for integrating marine and freshwater data.[29] Additionally, climate and oceanographic information for all five salmon species is being integrated into the *State of the Oceans Reports*.[30] *State of the Oceans Reports* offer timely overviews of changes in marine conditions in the previous year (and forecasts if possible) in the context of many years of observations. These reports also offer insight into marine ecology, ocean climate and fisheries.

2.10.2.2. Implementation Gaps and Next Steps

DFO has not finalized the freshwater monitoring programs for Step 3.1 or identified fishery, habitat and cultivation (i.e. enhancement and aquaculture) ecosystem objectives. Additionally, more research on the linkages between salmon marine survivals and time series of satellite sea surface temperature (SST), chlorophyll imagery and other secondary derived products from these time series such as timing of spring bloom and summer maximum temperature or chlorophyll is required.

Science will continue to integrate salmon information into annual *State of Oceans* reports, including additional application of oceanographic and climate indicator information. There is a need to make more linkages between the *State of Oceans* reports and the IFMP process.

[29] Irvine, J. and Crawford, B.[Editors] 2008: *State of physical, biological, and selected fishery resources of Pacific Canadian marine ecosystems*. CSAS Research Doc. 2008/013. (http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2008/2008_013-eng.htm); *State of physical, biological, and selected fishery resources of Pacific Canadian marine ecosystems.* DFO Can. Sci. Advis. Sec. Res. Doc. 2009/022. vi + 121 p. (http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2009/2009_022-eng.htm); Crawford, W.R. and J. R. Irvine. 2010. *State of physical, biological, and selected fishery resources of Pacific Canadian marine ecosystems in 2009.* DFO Can. Sci. Advis. Sec. Res. Doc. 2010/053. (http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2010/2010_053_e.pdf); Hyatt et al, July 2010. *Space and time boundaries on ecosystem(s) within which specific survival and production variation events or trends for Fraser and non-Fraser sockeye CUs are controlled* (draft document for Cohen Commission); (IS THERE A FINAL PUBLISHED VERSION OF THIS DOCUMENT??) and a CSAP workshop on integrating marine information with salmon forecasts and out-migration timing, February 2010 (ARE THERE PUBLISHED MINUTES FROM THIS WORKSHOP??).

[30] Crawford, W.R. and J. R. Irvine. 2010. *State of the Pacific Ocean 2009.* CSAS 2010/34 (http://www.dfo-mpo.gc.ca/csas/Csas/Publications/SAR-AS/2010/2010_034_E.pdf); and DFO. 2009. *State of the Pacific Ocean 2008*. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2009/030 (http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2009/2009_030_e.pdf).

2.11. Strategy 4: Integrated Strategic Planning

The purpose of Strategy 4 is to develop long-term strategic plans for CUs and groups of CUs and their habitat subject to common risk factors. These strategic plans will inform the development of annual fishery management, habitat, and enhancement plans and form the basis for ongoing dialogue with First Nations governments, Provincial, Territorial and local governments and other private parties.

2.11.1. Implement an Interim Process for Management of Priority CUs

The DFO committed to developing interim procedures that build on and expand the approach now used to develop IFMP's for salmon and include the following five steps:

1. Identify planning priorities:
   a. DFO staff will provide an overview report that identifies the CUs exploited by fisheries within each planning unit and gives summary information on their biological status (Red, Amber or Green).
   b. Key habitat and ecosystem constraints or threats to individual CUs will also be summarised by watershed.
   c. For CUs in the Red zone more detailed reports will also be provided as they become available. These detailed reports will consider and incorporate ATK, where available, and be subject to peer review through CSAP.
   d. Participants in the planning process will be asked to develop key priorities for each planning unit.
2. Identify resource management options and alternative management strategies in consultation with First Nations and other participants in the planning process.
3. With input from First Nations and other participants in the planning process, establish biological, social, and economic performance indicators as part of an evaluation framework for comparing the management alternatives developed in Step 2.
4. Assess the likely impacts of management alternatives by developing a set of predicted outcomes.
5. Select the preferred management alternative.
   a. The predicted outcomes from Step 4 will help in selecting a preferred management strategy.
   b. The decisions made for each planning unit will collectively form the regional strategic plan for the management of fisheries and watersheds. The plan will include activities and management actions to be undertaken over a medium- to long-term timeframe. It will also stipulate explicit biological targets to be achieved for individual Conservation Units and groups of CUs and, where appropriate, anticipated timeframes for rebuilding.

2.11.1.1. Progress to Date

A discussion paper titled, *Interim Guidance for the Development of Strategic Plans under Canada's Policy for the Conservation of Wild Pacific Salmon*[31], was released on December 15, 2007 to provide guidance on the new planning structure for wild salmon under the WSP. The paper identifies and discusses appropriate procedures for developing strategic plans and suggests a template for documenting strategic plans. This discussion paper was circulated and discussed with First Nations, partners and stakeholders at the WSP Forum on March 27-28, 2008.

There are four WSP planning initiatives underway that will follow the above five-step planning process. These initiatives are described in more detail below.

[31] Fraser, G. Alex, *Interim Guidance for the Development of Strategic Plans under Canada's Policy for the Conservation of Wild Pacific Salmon*, Prepared for Fisheries & Oceans Canada, December 15, 2007. http://www.pac.dfo-mpo.gc.ca/consultation/wsp-pss/2008/docs-eng/spg.pdf.

2.11.1.2. Implementation Gaps and Next Steps

Develop management reference points for each salmon species that account not only biological status, but also for habitat, ecosystem, and socio-economic factors. Improve data sharing of habitat project reports between habitat practitioners, major projects, and stock assessment on stock status.

2.11.1.3. Fraser River Sockeye Spawning Initiative

The Fraser River Sockeye Spawning Initiative (FRSSI)[32] has been an 8-year process to develop and implement new guidelines for setting annual escapement and exploitation targets for Fraser sockeye stocks. In 2003, Fisheries and Oceans Canada (DFO) committed to reviewing the rebuilding plan, which had been in place since 1987, and established a collaborative planning process for incorporating new information and emerging policies. The technical groundwork was laid through the development of a simulation model that was followed by an intensive two-year planning exercise that merged the FRSSI model into a pilot implementation of the integrated management processes envisioned under the WSP.

The FRSSI model was developed to improve understanding of the complex interaction between the population dynamics of individual stocks and escapement strategies that, due to practical constraints on in-season management, are applied to groups of stocks. The model currently includes 19 stocks (i.e. production units delineated based on spawning site and timing), grouped into four timing aggregates for management purposes. Each model scenario applies a specified escapement strategy to a timing aggregate 48 years into the future, starting with recent years, and tracks the performance of each individual stock within the aggregate.

The initiative is not on a CU basis, as CUs were not finalized when it was initiated. The initiative considers escapement for Early Stuart, Early Summer, Summer, and Late Fraser sockeye.

2.11.1.4. Barkley Sound WSP Initiative

Barkley Sound, Alberni Inlet, and their tributaries (i.e. Statistical Area 23) were selected as an implementation pilot for collaborative planning under Strategy 4 of the WSP. Lessons from this pilot process and the Fraser River Sockeye Spawning Initiative will be used to shape a coast-wide implementation plan for integrated planning processes under the WSP.

Barkley Sound and Alberni Inlet contain several sockeye conservation units (CU), and are an important part of larger CUs for chinook, coho, pink, and chum salmon. As a first step under the Initiative, CUs were prioritized for assessment, namely South West Vancouver Island Chinook and three sockeye CUs in Alberni Inlet. A preliminary benchmark assessment for one of those priority CUs, Somass sockeye, has been conducted. It has also been identified that the existing assessment framework for Somass sockeye and WCVI Chinook will be used for this pilot.

In regards to habitat assessments, a habitat status template and report was completed for the Sarita watershed. The Henderson and Somass watersheds were identified as priority watersheds. The status reports include information on highly productive and limiting habitats and relevant habitat indicators. Work on the development of ecosystem objectives and indicators has also begun, and an Ecosystem Overview Assessment Report has been drafted (EOAR)(Okey et al., 2010).

Two public meetings were held to discuss the Barkley Sound WSP initiative with a broad spectrum of interests, including First Nations, the Province of BC, commercial and recreational harvesters, and environmental non-governmental agencies. The purpose of these meetings was to identify the key objectives for the Barkley Sound WSP Initiative and to discuss potential issues.

[32] CSAS Manuscript report 2855. Pestal, G.; Ryall, P.; Cass, A. 2008. *Collaborative development of escapement strategies for Fraser River sockeye : summary report 2003-2008.* http://www.dfo-mpo.gc.ca/Library/334450.pdf

The Barkley Sound WSP Initiative will be an opportunity to engage partners on monitoring and assessment of biological, ecosystem and socio-economic values. The Initiative will also allow for multiple interests to engage and participate in the planning process. Furthermore, the integrated plan for Barkley Sound will serve to improve coherence among internal programs, such as fisheries management and habitat restoration, as well as link to external initiatives, such as Marine Stewardship Certification (MSC) of the Barkley sockeye fishery.

2.11.1.5. Skeena Watershed Initiative

The Skeena Watershed Initiative has made significant progress laying the scientific foundation to support full implementation of the WSP. Salmon CUs have been delineated in the Skeena Watershed and the Pacific Salmon Foundation has taken a leadership role to define steelhead CUs using the Ciruna et. al. methodology. Preliminary stock status benchmarks are also being defined and a Canadian Science Advisory Secretariat Report is anticipated for spring 2011. The approach to habitat assessment does not appear to follow the approved methodology.

Shifts away from traditional fisheries management and enhancement objectives to align with the WSP have also been undertaken. Examples include keeping sockeye exploitations rates somewhat lower than the 65 percent that enhanced stocks could sustain in an effort to prevent declines in Babine wild stocks as well as an ongoing initiative to shift commercial fishing from the ocean areas into the river have also been undertaken.

The Report of the Skeena Independent Science Panel (Walters et. al. 2008) and a parallel socio-economic study also represents a significant contribution to inform full implementation of the WSP. Along withy providing recommendations relevant to improved CU and habitat monitoring and guidance about a governance structure to support integrated planning, the reports demonstrate that the WSP principle of sustainable use is being upheld. Conservation is considered in the context of climate change variability and balancing trade-offs identified by First Nations and stakeholders.

First Nations, stakeholders and the Province have been engaged in the development of a WSP-focussed work plan for the Skeena Watershed; however establishment of a collaborative integrated planning arrangement has been stymied by the pursuit of different, narrowly defined interests specifically amongst the recreational and commercial sectors. Lack of integration of these interests within a single, overarching management policy has promoted strong advocacy positions and perpetual conflict.

2.11.1.6. Cowichan Watershed Board

Awaiting summary.

2.11.2. Design & Implement Integrated Strategic Panning for Salmon Conservation

In March 2009, a discussion paper on identifying planning units for integrated strategic plans was drafted.[33] Under the proposed approach, conservation units are grouped together into planning units to effectively facilitate integrated planning. The paper proposes to develop integrated plans on the scale of Freshwater Adaptive Zones, of which there are 23 in BC. However, if practical, these Freshwater Adaptive Zones could be amalgamated into planning units or Fisheries Production Areas, of which seven are proposed for BC. This paper was circulated internally within DFO Pacific Region and discussed at an internal workshop on March 10, 2009. At the workshop, participants agreed to the planning units

[33] Fraser and Associates, *Identifying Planning Units and Prioritizing Integrated Strategic Planning Initiatives under the Wild Salmon Policy*, Prepared for Fisheries and Oceans Canada, March 2009.

approach. It was also discussed that integrated strategic planning would be coherent with existing DFO processes, such as IFMPs, and linked to external planning processes, such as watershed roundtables and marine use planning.

On June 25, 2009, the proposed approach towards integrated strategic planning was presented to DFO Operations Committee. The Operations Committee approved the move toward fisheries planning at the Freshwater Adaptive Zones and Fisheries Production Areas scale.

Further work is required to develop a framework for integrated strategic planning and ensure alignment with existing planning processes, including existing watershed, IFMP, and marine coastal planning and processes.

2.12. Strategy 5: Annual Program Delivery

Under the Wild Salmon Policy, Strategy 5 refers to annual operating plans that will detail specific short-term actions to achieve the objectives outlined in the strategic plan under Strategy 4. These short-term actions include the assessment of conservation units, fisheries management, habitat management and enhancement.

2.12.1. Assess the Status of Conservation Units and Populations

2.12.1.1. Progress to Date

As discussed under Strategy 1, Stock Assessment Division (StAD) currently develops an annual Salmon Outlook, which provides an evaluation of the expected status of aggregates of salmon populations. A synoptic review methodology that determines the status of conservation units has been drafted. This synoptic review will be used to identify priority CUs and inform the development of the assessment frameworks.

Additionally, preliminary assessment frameworks (AFs) have been completed for coho CUs, Fraser sockeye, and all salmon species in the North Coast. A draft Stock Assessment Framework that is tied into the fisheries management framework and provides guidance on how to determine the level of monitoring programs in the assessment has been developed.

2.12.1.2. Implementation Gaps and Challenges

Challenges and next steps for CU assessment are discussed under Action Step 1.3.

2.12.2. Plan and Conduct Annual Fisheries

Action Step 5.2, requires specific annual fisheries management measures required by the management strategies selected under Strategy 4 to be identified and documented in annual Integrated Fishery Management Plans. Another key element of annual fisheries planning will be the development of explicit agreed-upon rules for in-season decision-making.

2.12.2.1. Progress to Date

Progress has been made in the adoption of WSP principles and objectives through current salmon IFMP processes. For example, the 2010 Salmon IFMP for Southern BC identifies *manage fisheries for sustainable benefits* as a key objective for the fishery. IFMPs include arrangements for food, social and ceremonial and treaty fisheries by First Nations and selective harvesting and other regulatory measures, as indicated under the WSP. IFMPs also have explicit agreed-upon rules for in-season decision-making and uncertainties and are developed with the Integrated Salmon Harvest Planning Committee.

2.12.2.2. Implementation Gaps and Challenges

Much of the implementation of Action Step 5.2 is dependent on the development of Strategy 1. As discussed earlier, the annual management of fisheries will depend on the capacity and ability to assess and monitor CUs. Once the CU assessments become available, fisheries managers will be able to take this information into account when developing specific management strategies.

The development of planning initiatives such as the Fraser River Sockeye Spawning Initiative, the Barkley Sound WSP initiative, and the Skeena watershed planning process will serve to inform annual fisheries planning throughout Pacific Region.

On a broader level, the Department will need to ensure that IFMPs are integrated with other planning processes, such as watershed and marine use plans. The Department will continue to participate in current advisory processes, consultations, and external forums to engage with First Nations, the Province of BC, Yukon Territorial Government, local governments, harvesters, stewardship groups, and other interest groups in order to seek inclusive and comprehensive input into the integrated fisheries plans.

2.12.3. Plan and Implement Annual Habitat Management Activities

Under Action Step 5.3, the habitat program work will shift from being largely reactive, to being planned and strategically directed to protect habitat and to implement management measures that meet the long-term objectives specified by Strategic Plans (Strategy 4). Annual work plans will specify priorities for habitat rehabilitation or restoration work that will be undertaken by DFO or by DFO in partnership with others, and investigative work that may be undertaken to fill knowledge gaps. On an annual basis, a report on regulatory functions related to key habitats and restoration and rehabilitation works will be prepared. Habitat assessment and monitoring will feed back into the Habitat Management Program to evaluate measures for habitat protection and compliance, and to guide future program improvements.

2.12.3.1. Progress to Date

Currently, habitat management activities are developed and implemented through annual habitat work plans at both the regional and area levels. These work plans are guided by habitat mandates under the *Fisheries Act*, but embrace the principles and objectives of the WSP, as well as other departmental policies and directives.

In terms of reporting on habitat management, the Department currently collects and reports information on referrals, environmental assessments and other regulatory decisions taken by the Habitat Management Program. In addition, the Department annually reports to Parliament on administration and enforcement of the Habitat Protection Provisions of the *Fisheries Act*. Performance measures are being developed for the Habitat Management Program under the departmental Performance Measurement Framework, which are reported out annually to the Treasury Board.

2.12.3.2. Implementation Gaps and Challenges

Implementation gaps for this Action Step are largely discussed under Strategy 2. Further work is required to identify select watersheds in CUs for habitat status reports, to develop a habitat health monitoring framework, to access and update provincially held datasets pertaining to habitat indicators, to develop CU overview reports, to engage external interests in contributing to habitat status reports and monitoring, and to provide this information to integrated planning processes in order to identify key habitats within CUs that require protection, restoration or rehabilitation.

2.12.4. Plan and Implement Annual Enhancement Activities

The long-term objectives for enhancement projects will be set as part of a planning or recovery process for a Conservation Unit. Enhancement programs will last more than a year, but annual production targets and strategies will be documented in IFMP's and will be consistent with objectives for CUs.

2.12.4.1. Progress to Date

Currently, planning for enhancement activities are incorporated into the salmon IFMPs. Annual production targets, including targets for egg takes and brood production, and operational details for each hatchery and community economic development projects are noted in the IFMPs (Section 3.7). Enhancement objectives are consistent with CU objectives, where defined (e.g. Cultus sockeye), and with identified harvest and stock assessment objectives. Where a conservation strategy or recovery plan exists for a conservation unit, enhancement activities are consistent with those plans and enhancement guidelines and practices are in place. Recovery planning and enhancement activities have been undertaken to rebuild and recover CUs experiencing poor survival rates.

In terms of follow-up, post-season reviews of the salmon IFMPs compare actual enhancement activities to pre-season plans (Section 8.6 of the IFMP) to ensure achievement of recovery or rebuilding objectives. In addition, production is assessed for adherence to the rebuilding schedule and guidelines for populations for which there is a conservation or recovery plan and for indicator populations.

2.12.4.2. Implementation Gaps and Challenges

Further work is required in identifying priority CUs where enhancement may be used for rebuilding or recovering those CUs. These assessments can then inform priorities for enhancement projects.

2.13. Strategy 6: Performance Review

Under Strategy 6, the DFO committed to undertake two levels of evaluation - annual feedback on the implementation of measures taken and periodic reviews of the overall success of the WSP in meeting its goal and objectives.

2.13.1. Conduct post-season review of annual work plans

Action Step 6.1 requires the provision of annual feedback on the implementation of measures taken as part of annual plans specified for fisheries, habitat, enhancement and assessment. Further, it evaluates whether adequate progress is being made to achieve the objectives defined in the strategic plan for the CU.

2.13.1.1. Progress to Date

The WSP implementation team has developed and reported on WSP implementation work plans on an annual basis and reported to senior management every year from 2005-2010. Additionally, fishing plans and targets, enhancement plans, and habitat regulatory reviews are evaluated by the Department on an annual basis.

2.13.1.2. Implementation Gaps and Next Steps

This Action Step can not be fully implemented as there have not been objectives defined under strategic plans for each CU. As Strategic Plans are developed under Strategy 4, the Department will evaluate their success as part of regular post-season review and work planning.

2.13.2. Conduct regular reviews of the success of the WSP

Action Step 6.1 provides for periodic reviews of the overall success of the WSP in meeting its goal and objectives.

2.13.2.1. Progress to Date

In anticipation of the need to complete a 5-year review of the overall success of the WSP, the DFO asked the Pacific Fisheries Resource Conservation Council (PFRCC) to provide an evaluative framework for an independent review of WSP in March 2009.[34] The Review Framework report did not provide recommendations on the scope, focus, or performance measures for a review. The report presented a ten-step review framework that emphasized stakeholder input, including a separate process for consulting with First Nations. The review framework suggested that DFO should establish a review management structure that would determine the themes, focus, scope, performance measures, and sources of information for the review. At a subsequent meeting with the PFRCC on work planning, they did not express an interest in further leading/participating in an independent review of the WSP.

The WSP Implementation Team (Pacific Region), in consultation with the DFO Evaluation directorate (NHQ) drafted a plan for an independent review of the WSP based, in part, on the advice provided by the PFRCC. Senior management requested that the WSP implementation team undertake a review process that considered the incremental operational changes in programs, as well as any targeted activities, and a gap analysis of policy implementation to identify priorities and improve linkages with programs. Additionally, the WSP Implementation Team was asked to refine the plan for an independent review.

The Department has also received several reports that provide recommendations on WSP implementation from external organizations.[35] A summary of the recommendations from these reports and the DFO response is found in Appendix X.

2.13.2.2. Implementation Gaps and Next Steps

The Region still needs to develop an overall evaluation approach for WSP implementation and a 5-year independent review needs to be completed. It is anticipated that an independent review will be conducted by the end of 2011 – consistent with finalization of the Barkley Sound Planning Initiative and the review of the FRSSI process.

Currently, the DFO is completing a national policy review. This policy review may also provide the framework for conducting regular policy evaluations.

3. Overall Opportunities Challenges and Gaps

1. Numerous organizations (e.g., Moore Foundation, Regional municipalities, Chief Chamberlain meeting, Streamkeepers, SEHAB, etc.) are seeking to collaborate on WSP implementation and are bringing resources to the table
2. There are already many existing fisheries and watershed governance structures where DFO is not the lead, but has established positive and proactive relationships

[34] The DFO received this report in March 2010. The PFRCC released a report entitled *Developing a Wild Salmon Policy Review Framework: Stakeholder Perspectives on Review Components* (http://www.fish.bc.ca/developing-wild-salmon-policy-review-framework-stakeholder-perspectives-review-components-1)

[35] *Recommendations from the Advisory: Implementing the Habitat and Ecosystem Components of DFO's Wild Salmon Policy – October 2006.* PFRCC Report. *Recommendations from Returning Salmon: Integrated planning and the Wild Salmon Policy in B.C. – March 2008.* David Suzuki Foundation Report by Marc Nelitz, *et al.* (http://www.davidsuzuki.org/publications/reports/2008/returning-salmon-integrated-planning-and-the-wild-salmon-policy-in-bc/index.php). *Reconciling the conservation of wild salmon and the production of enhanced salmon under Canada's Wild Salmon Policy: A discussion*, February 23-24, 2009. SFU Harbour Centre, Vancouver, BC. (http://www.sfu.ca/cstudies/science/resources/salmon/EnhancementWorkshopReport.pdf). *Knowledge Integration in Salmon Conservation and Sustainability Planning: Towards Effective Implementation of Wild Salmon Policy Strategy Four*. David Suzuki Foundation. March 2009 (http://www.davidsuzuki.org/publications/reports/2009/knowledge-integration-in-salmon-conservation-and-sustainability-planning/).

3. Science-based organizations are moving forward with the development of ecosystem-based management indicators and are seeking to work jointly with DFO
4. Momentum exists with the completion of scientific methodologies for Strategy 1 & 2 and engagement with Area Staff

- Resources (Funds and FTE's) :
  - Resources to leverage and capitalize on collaborative opportunities are limited
  - The foundational science elements of the WSP strategies require a significant investment of resources from within existing budgets
  - WSP is a regional priority that has limited influence in budgeting / priority setting exercises undertaken nationally
  - Priority CU's have not been identified
- Stakeholder expectations
  - Resource users (Aboriginal and non-Aboriginal), environmental non-governmental agencies and other groups often have competing interests.
- Data - deficiency & lack of integration
- Integration:
  - Priority areas/CU's are not resolved
  - WSP implementation is not sector-driven or sector-specific
  - Implementation of new methodologies requires significant Area engagement
  - Resource management and assessment staff are not using conservation Units as the focal point for their research, planning and decision-making activities.
  - Current sector based approach does not seem like the most effective model for successful WSP implementation
  - Integration with National priorities

4. Next Steps

- Ecosystem-based Indicators & Objectives
- WSP Pilots
- Integrated Planning & Governance
- Priority CU's
- WSP Review
- WSP Communications & Consultation
- Stock Assessment Framework
- Linkages with StreamKeepers and salmon enhancement societies
- WSP Monitoring Framework
- WSP Integrated Data Management

Appendix – WSP Consultation

- November 2010. Salmon Integrated Harvest Planning Committee (IHPC), WSP presentation
- June 1, 2010. Lower Fraser First Nations Community Meeting, Wild Salmon Policy Update
- March 24, 2010. Skeena Watershed Initiative meeting
- February 9-11, 2010. Barkley Sound Knowledge Symposium. Bamfield Marine Sciences Centre. http://www.westcoastaquatic.ca/barkleysymposium/sites/default/files/u4/Barkley%20Symposium%
- February 1-2, 2010. Skeena Watershed Initiative meeting
- January 2010. Fraser Watershed Joint Technical Forum - FRSSI update
- DATES. Alberni-Barkley Integrated Salmon Management Steering Committee meetings
- December 2009. UFFCA FRSSI Update.
- November 26, 2009. Barkley Sound Round Table
- November 3, 2009. Barkley Sound Wild Salmon Policy Integrated Planning meeting
- November 3, 2009. Skeena Watershed Initiative meeting
- November 2009. Salmon Integrated Harvest Planning Committee (IHPC), WSP presentation
- October 7, 2009. Barkley Sound Wild Salmon Policy Implementation Steering Committee
- Sept 2009. PSARC workshop on ecosystem paper. WHERE ARE THE MATERIALS FOR THIS? FOR POSTING ON WEBSITE?
- July 15, 2009. Fraser Watershed Joint Technical Committee Meeting. Strategy 4 Integrated Planning. http://www.frafs.ca/sites/default/files/WSP%20Stategy%204%20Update%20-%20Integrated%20Planning.pdf
- June 15, 2009. Skeena Salmon Habitat Conference - Institutional Change and the Wild Salmon Policy
- May 4, 2009. DFO meeting with Watershed Watch and David Suzuki Foundation in response to their report: *Knowledge Integration in Salmon Conservation and Sustainability Planning: Towards Effective Implementation of Wild Salmon Policy Strategy Four*
- March 2009. Proceedings of DFO Workshop on Wild Salmon Policy Strategy 4: Integrated Strategic Planning (Report dated May 2009)
- February 23-24, 2009. Reconciling the conservation of wild salmon and the production of enhanced salmon under Canada's Wild Pacific Salmon Policy: A discussion. SFU Harbour Centre, Vancouver, BC. http://www.sfu.ca/cstudies/science/resources/salmon/EnhancementWorkshopReport.pdf
- January 15-16, 2009. Results of a Peer Review Workshop on the Draft Report "Canada's Policy for Conservation of Wild Pacific Salmon: Proposed Stream, Lake, and Estuarine Habitat Indicators"; http://www.dfo-mpo.gc.ca/csas-sccs/publications/pro-cr/2009/2009_038-eng.htm
- January 5-6, 2009. Workshop on methods for assessing status and identifying benchmarks for Conservation Units of the Wild Salmon Policy, is available at http://www.dfo-mpo.gc.ca/csas-sccs/publications/pro-cr/2009/2009_046-eng.htm
- Jan 9, 2009. Port Alberni Stakeholder Meeting on Barkley Sound Pilot
- 2009. Integrated Salmon Dialogue Forum. http://www.thinksalmon.com/fswp_project/item/integrated_salmon_dialogue_forum1/
- January – September 2009. BC Pacific Salmon Forum. http://www.pacificsalmonforum.ca/final/BCPSFFinRptqSm.pdf
- January 2009. PSARC workshops were hosted to review methodologies for developing indicators and benchmarks of biological and habitat status, http://www.dfo-mpo.gc.ca/csas-sccs/publications/pro-cr/2009/2009_038-eng.htm
- October 29, 2008. Fraser Watershed Joint Technical Committee Meeting. http://www.frafs.ca/sites/default/files/FWJTC%20minutes%20Oct%2029%202008%20FINAL.pdf
- Oct-Nov 2008. Community Dialogue Sessions. http://www.pac.dfo-mpo.gc.ca/consultation/dialogues/2008/index-eng.htm

- Aug 16-17 2008. Haig-Brown Symposium on Sustaining Wild Salmon: Moving from Words to Action. Proceedings available at http://www.sfu.ca/cstudies/science/resources/1273697156.pdf
- July 16, 2008. Fraser Watershed Joint Technical Committee Meeting. Wild Salmon Policy CUs. http://www.frafs.ca/sites/default/files/WSP%20CUs.pdf
- July 3, 2008. Barkley Update????
- June 17, 2008. Marine Use Planning Workshop????
- April 8, 2008. Visions Conference????
- March 2008. WSP Stakeholder Forum. http://www.pac.dfo-mpo.gc.ca/consultation/wsp-pss/2008/index-eng.htm
- March 2008. A detailed progress update from is available at http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/wsp-pss/news-nouvelles-eng.htm.December 11, 2007. Fraser Watershed Joint Technical Committee Meeting. FRSSI Update. http://www.frafs.ca/sites/default/files/FRSSI%20Update.pdf
- October and November, 2007. Fall Community Dialogue Sessions. http://www.pac.dfo-mpo.gc.ca/consultation/dialogues/2007/rep-rap-prog-av/index-eng.htm
- June 2007. Habitat Indicators Workshop (WAS THERE A REPORT THAT CAN BE PUBLISHED ON-LINE)
- March 21-22, 2007. DFO Wild Salmon Policy: Ecosystem Values and Indicators Workshop. Vancouver, BC. http://www.sehab.org/pdf/07-03%20DFO%20Eco-Workshop%20Summary%20Report.pdf
- March, 2007. FRSSI Meeting
- February, 2007. FRSSI Meeting
- January, 2007. FRSSI Meeting
- November 22 - 23, 2006. WCVI Wild Salmon Summit. Hupacasath House of Gathering. http://www.westcoastaquatic.ca/Wild_Salmon_Summit.htm
- October 2006- January 2007. A series of community and First Nations consultations on the identification of CUs, and the methodology are detailed in Appendix 8 of Holtby and Ciruna (2007). http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2007/2007_070-eng.htm
- March 2006. WSP Multi-Stakeholder Meeting (http://dev-public.rhq.pac.dfo-mpo.gc.ca/Comm/pages/consultations/Consultation2006/main_e.htm)
- March 23 - 24, 2006. Workshop to Design a Public Consultation Process on Implementing the Wild Salmon Policy Strategy 3: The Inclusion of Ecosystem Values and Monitoring into Wild Pacific Salmon Management. Richmond, BC WHERE ARE THE MATERIALS FOR THIS? FOR POSTING ON WEBSITE?
- March 22, 2006. First Nations Forum on Implementing Strategy 3 of the Wild Salmon Policy: The Inclusion of Ecosystem Values and Monitoring. Airport Delta Hotel, Vancouver. WHERE ARE THE MATERIALS FOR THIS? FOR POSTING ON WEBSITE?
- February, 2006. FRSSI Meeting
- January, 2006. FRSSI Meeting
- December 2005, FRSSI Management Meeting, Summarized in Collaborative development of escapement strategies for Fraser River sockeye : summary report 2003-2008
- Series of stakeholder meetings [WHAT ARE THE EXACT DATES OF THESE MEETINGS – ARE THERE MINUTES FOR POSTING?] '06-'08 PFRCC, MCC, SEHAB, Streamkeepers, Watershed Watch, SNFC, SFU, FSWP and
- Strategy 3 sessions with US Scientists and UBC Workshop [WHAT IS THE EXACT DATE OF THIS WORKSHOP – ARE THERE MINUTES FOR POSTING?]